U.S. Army Center for Health Promotion and Preventive Medicine

EPIDEMIOLOGICAL CONSULTATION NO. 12-MA-083E-08
RISK FACTORS FOR INJURY AND CIGARETTE SMOKING AND
TEMPORAL TRENDS IN DEMOGRAPHIC
AND LIFESTYLE CHARACTERISTICS
AMONG U.S. ARMY ORDNANCE SCHOOL STUDENTS
2000–2006

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14. ABSTRACT

Upon arrival for Advanced Individual Training (AIT), service members at the Aberdeen Proving Ground, Maryland, Army Ordnance School (n=27,289 men and 3,856 women) completed a questionnaire that 1) collected demographic and lifestyle information 2) asked if they had a training-related injury that would interfere with their performance during AIT, and 3) asked about their use of tobacco products 30 days before Basic Combat Training (BCT). It was administered as new students arrived every week from 2000 through 2006. To examine potential temporal changes in demographic and lifestyle characteristics over the years, chi-square and linear trend statistics were used. Potential risk factors for self-reported injury and cigarette use were explored using logistic regression. A majority of the service members were male, between the ages of 17 and 24, Caucasian, of lower rank (E1), and had attended basic training at Fort Knox or Fort Jackson. An injury that the service member said would interfere with their training was reported by 8% of men and 17% of women. In the 30 days before BCT, 43% of the service members smoked one or more cigarettes and 35% reported smoking on 20 or more days. For men and women, higher risk of injury was associated with older age and having a current self-reported injury. The risk of smoking on 20 or more days was higher among 20–29 year old men and 20+ year old women, Caucasians, and smokeless tobacco users. Throughout the last 7 years, demographic and lifestyle changes have occurred at the Ordnance School, reflecting those seen in BCT.

15. SUBJECT TERMS
Age, rank, ethnicity, injury, smokeless tobacco, illness, basic combat training, military

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EPIDEMIOLOGICAL CONSULTATION REPORT NO. 12-MA-083E-08
RISK FACTORS FOR INJURY AND CIGARETTE SMOKING AND TEMPORAL TRENDS IN DEMOGRAPHIC AND LIFESTYLE CHARACTERISTICS AMONG U.S. ARMY ORDNANCE SCHOOL STUDENTS 2000–2006

1. INTRODUCTION. Shortly after graduation from basic combat training (BCT), many Soldiers begin Advanced Individual Training (AIT), where they will learn their Military Occupational Specialty (MOS). It has been reported (anecdotally) that trainees often leave BCT injured and enter AIT with these preexisting injuries. The U.S. Army Center for Health Promotion Preventive Medicine (USACHPPM) worked with Kirk Army Health Clinic to develop a survey identifying injuries and illnesses, thereby allowing injured Soldiers to be identified and receive immediate medical treatment. This report investigates the data from the survey to examine risk factors associated with training-related injuries on arrival at Ordnance AIT and risk factors associated with prior cigarette use, as well as temporal trends in demographics among Ordnance AIT students over the 7-year period.

2. METHODS.

a. From January 2000 to December 2006 the USACHPPM collaborated with the 16th and 143rd Battalions at the Army Ordnance School and Kirk Army Health Clinic at Aberdeen Proving Ground (APG), Maryland, to administer a 20-minute questionnaire during in-processing of newly arrived Ordnance School service members. The service members had recently (generally within a few days) graduated from BCT and had just arrived at APG to train for their MOS. As a part of the in-processing procedures, each service member was asked to complete the Soldier Health In-Processing (SHIP) questionnaire. The questionnaire asked the service members about their demographics and lifestyle characteristics. Information requested included whether or not the student currently had an injury or illness that would affect their AIT performance, history of their tobacco use, date of birth, gender, rank, race, and BCT site.

b. Descriptive statistics (frequencies, distributions) were calculated for demographics (age group, gender, race, rank, and BCT site), current injury, current illness, and tobacco for men and women. Chi-square was used to examine any differences between men and women. To examine potential temporal changes in these variables, students were aggregated by year and comparisons among years were made using chi-square and linear trend statistics. Means and standard deviations were calculated for some variables.

c. Potential risk factors for self-reported injury and cigarette use were explored using logistic regression. Univariate logistic regression was performed with injury and cigarette use as separate health outcome variables. Odds ratios (OR) and 95% confidence intervals (95%CI)

were calculated for each risk factor. Risk factors from the univariate analysis with a $p < 0.05$ were selected for multivariate logistic regression, which produced ORs and 95%CIs. A "recent smoker" was defined as service members who smoked one or more cigarettes in the 30 days before BCT. A "smoker" was defined as one who smoked on 20 or more days in the 30 days before BCT. A "recent smokeless tobacco user" was defined as using smokeless tobacco at least once in the 30 days before BCT. A "smokeless tobacco user" was defined as using smokeless tobacco on 20 or more days in the 30 days before BCT.

3. RESULTS.

a. A majority of the service members entering Ordnance AIT at APG from 2000 to 2006 were male (87%), between the ages of 17 and 24 (85%), Caucasian (60%), military rank of E1 (52%), and had attended basic training at Ft Knox or Ft Jackson (82%). When service members were asked if they presently had an injury that would interfere with their training, 17% of the women and 8% of the men responded positively (risk ratio (women/men) = 2.3, 95%CI:2.1–2.5). The majority of these injuries (83%) were reported to have occurred during BCT. When service members were asked if they presently had an illness that would interfere with their training, 3% of the women and 2% of the men responded positively (risk ratio (women/men) =1.5, 95%CI–1.3–1.9). In the 30 days before BCT, 43% of the service members smoked one or more cigarettes and 35% reported smoking on 20 or more days. Moreover, 16% of the men and 3% of the women reported using smokeless tobacco at least once in the 30 days before BCT, and 11% of the men and 2% of the women reported using on 20 or more days. Of these, 63% used less than 1 can, pouch, or plug per day.

b. Temporal trends were noted over the 7-year survey period. The proportion of men increased by 2%, whereas the proportion of women decreased by 14%. Both men and women showed a 16% and 12% (respectively) decrease in the proportion of 17–19 year olds and an increase in the older age groups over the survey period. Among men, there was a 13% increase in the proportion of Caucasians and a decrease in the number of Blacks and Native Americans; among women, there was an increase in the proportion of Caucasians, Hispanics, and Asians and a decrease in Blacks and Native Americans. Men and women arriving from Ft Jackson increased a substantial 58%, while those arriving from Ft Knox, Ft Leonard Wood, Ft Benning (men only), and Ft Sill decreased. Of those with an injury, approximately 7% reported that the injury occurred before BCT, 83% during BCT, and 10% after. The proportion of service members using cigarettes remained relative stable over the 7-year survey period. However, the amount of cigarettes men smoked appeared to decrease over time as indicated by more responses to smoking ≤10 cigarettes per day and fewer responses to smoking ≥20 cigarettes per day. Smokeless tobacco use showed little or no trend over the years.

c. In univariate logistic regression models for men, self-reported injury risk was associated with older age, Black race (relative to Caucasians), a BCT location other than Ft Jackson, a current self-reported illness, recent smoking, and smoking. In the multivariate logistic regression

for men, higher risk of injury was independently associated with older age, Black race (relative to Caucasians), a BCT location other than Ft Jackson, having a current self-reported illness, and smoking. In the univariate logistic regression models for women, injury risk was associated with older age, "other" race (relative to Caucasians), higher rank, basic training at Ft Leonard Wood (compared with Ft Jackson), and a current self-reported illness. In multivariate logistic regression for women, higher injury risk was independently associated with older age, attending training at Ft Leonard Wood (relative to Ft Jackson), and having a current self-reported illness. Recent smokers, smokers and how many cigarettes smoked per day were all highly correlated, therefore only smokers were chosen to be retained in the multivariate model.

d. In the univariate logistic regression models for men, the risk of being a smoker was higher among those of Caucasian race, 20–24 year olds, recent smokeless tobacco users, smokeless tobacco users, and amount of smokeless tobacco used. In the multivariate logistic regression for men, the risk for smokers was independently associated with age, Caucasian race, and smokeless tobacco users. In the univariate logistic regression models for women, the risk for smokers was associated with age, Caucasian race, recent smokeless tobacco users, smokeless tobacco users and the amount of smokeless tobacco used. In the multivariate logistic regression for women, the risk for smokers was independently associated with age, Caucasian race, and smokeless tobacco users. Recent smokeless tobacco users, smokeless tobacco users and how much smokeless tobacco used per day were all highly correlated, therefore only smokeless tobacco users were chosen to be retained in the multivariate model.

4. DISCUSSION.

a. Temporal trends (2000–2006) from the survey data indicate that, at the Ordnance AIT at APG, there has been an increase in the age of service members entering training. The proportion of Caucasians has also increased, with concomitant decreases in the proportions of Blacks and Native Americans. These demographic trends are also reflected in data from the Office of the Army Demographics (except for Native Americans, for whom no data are available). The older age of service members may be attributed to recruiting efforts in the college market. The proportion of African Americans on active duty has declined over the past 10 years; however, the proportion of accessions (15%) has been fairly stable over the past three years, which reasonably reflects national demographics. Heavy cigarette smoking for men (20 or more cigarettes per day) decreased from 27% in 2000 to 19% in 2006. The Centers for Disease Control and Prevention and the Department of Defense have also found that heavy smoking among men has decreased over the past 11 years from 19% in 1993 to 12% in 2004 and from 34% in 1980 to 11% in 2005, respectively.

b. Age has been previously found to be a risk factor for injury during BCT, possibly due to the fact that with aging there is a loss of muscle mass, muscle strength, muscular endurance, aerobic capacity, and flexibility. It has also been demonstrated that when individuals perform at about the same level of physical activity, injury risk is higher in older individuals. Among men,

Black race remained as an independent risk factor, with a 20% greater chance of being injured when compared with Caucasians. This could be partially attributed to a possible difference in tendon physiology. The lower risk of injury among service members arriving from Ft Jackson is probably the result of the numerous injury-prevention initiatives undertaken at this location. Men and women had a 6.3 and a 5.6 times greater risk of reporting an injury if they currently reported having an illness that would affect their AIT performance. It is possible that the multiple stressors of BCT could have an impact on both injuries and illness. The relationship between tobacco use and injury may be due to a compromised ability to repair damaged tissues increasing susceptibility to overuse injuries.

c. Currently, 32% of the Army report any smoking (one or more cigarettes) within the last 30 days, which is lower than the 43% of the Soldiers in the current study who had smoked at least once in the 30 days prior to BCT. Risk of smoking was found to be highest among Caucasians (44%). The 2005 Department of Defense (DoD) Survey of Health Related Behaviors Among Active Duty Military Personnel looked at the prevalence of any cigarette smoking in the last 30 days and found that Caucasians (36%) had the highest risk and prevalence of smoking, in agreement with our finding among the men. However, the DoD survey reported a 24% prevalence among women, which is much lower than the 33% prevalence found here. On the other hand, 32% of 18 to 25-year-old Army women are smokers, which is representative of the majority of the age group in the Ordnance School.

d. Smokeless tobacco has been demonstrated to be used predominantly by men. In the univariate analysis, men and women smokers had a 3.5 and 5.1 times higher risk, respectively, than nonsmokers of having used smokeless tobacco at least once in the 30 days before BCT and a 2.9 and 3.8 times higher risk, respectively, of having used smokeless tobacco in 20 of the 30 days before BCT. It is possible that smokers use smokeless tobacco or smokeless tobacco users use cigarettes as a source of nicotine dosing.

5. CONCLUSIONS.

Temporal trends among US Army Ordnance School service members from 2000–2006 include an increase in older service members, Caucasians, and fewer men smoking more than 20 cigarettes per day. For both men and women, self-reported injury was associated with older age and a current self-reported illness. The risk of smoking on 20 or more days prior to BCT was associated with older age, Caucasian race, and smokeless tobacco use.

Epidemiological Report No. 12-MA-083E-08, 2000–2006

TABLE OF CONTENTS

Tables

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1. REFERENCES. Appendix A contains the references used in this report

2. AUTHORITY. Under Army Regulation 40-5[1], Preventive Medicine, July 2005 (paragraph 2-19), the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) is responsible for providing support of Army preventive medicine activities, to include interpretation of surveillance data, identification of leading health problems, and assistance in prevention and control of leading health problems. This project described and interpreted surveillance data collected in collaboration with the U.S. Army Ordnance Schools and Kirk Army Health Clinic (KAHC).

3. INTRODUCTION.

a. During basic combat training (BCT) recruits train to become skilled at military tasks, which include activities like road marches, rifle marksmanship, bayonet use, negotiating obstacle courses, hand-to-hand combat, first aid, drill and ceremony, and other activities. Physical fitness training is conducted 4–6 times per week and consists of both aerobic and strength training exercises. Recruit fitness, prior physical activity level, age, and lifestyle characteristics vary markedly from recruit to recruit on entry to BCT[2, 3]. Many of these factors have been shown to influence injury incidence during BCT[3,4,5], which has been reported to range between 21% and 42% for men and between 41% and 67% for women (6).

b. Shortly after graduation from BCT, Soldiers begin Advanced Individual Training (AIT), where they will learn their Military Occupational Specialties (MOS). AIT can last anywhere from 4 weeks to over a year, depending on the particular MOS. At Aberdeen Proving Ground (APG) Ordnance AIT, training is conducted for 9 to 26 weeks depending on the MOS the service member is attempting to qualify for as their specialty. In addition to Soldiers, a small number of Marines, Sailors, and Airmen do their training at the APG Ordnance School.

c. It has been reported (anecdotally) that trainees often leave BCT injured and enter AIT with preexisting injuries. The USACHPPM worked with KAHC to develop a survey identifying injuries and illnesses so that injured Soldiers could be identified and receive immediate medical treatment.

d. This report analyzes information from the questionnaire: (1) to determine possible risk factors for injury during BCT, and (2) to determine factors associated with cigarette use prior to BCT. In addition this report investigates any temporal trends in demographics among Ordnance AIT students over the 7-year period.

4. BACKGROUND LITERATURE.

a. Demographic Trends.

(1) The Office of Army Demographics[7] has compiled yearly data on age, race, rank, education, among other variables. In the period 2000–2005, the Office of Army Demographics showed a decrease in the proportion of enlisted Soldiers ages 17–20 and an increase in the proportion of Soldiers ages 21–24 (Table 1). (Data for 2006 and 2007 were not available at the time this report was being written.)

Table 1. Changes in the Age Distribution of Enlisted Soldiers in the U.S. Army, 2000–2005

Age Groups (years)	2000 (%)	2001 (%)	2002 (%)	2003 (%)	2004 (%)	2005 (%)
17–20	21	20	19	17	17	16
21–24	26	28	29	30	30	30
25–29	21	20	20	21	21	22
30–39	26	26	26	26	25	25
≥ 40	6	6	6	6	7	7

(2) With regard to race, the Office of Army Demographics shows that the proportion of Caucasians and Hispanics has been slowly increasing, while the proportion of Blacks decreased from 2000 to 2006 (Table 2).

Table 2. Changes in the Race Distribution of Enlisted Soldiers in the U.S. Army, 2000–2006

Race	2000 (%)	2001[a] (%)	2002 (%)	2003[a] (%)	2004 (%)	2005 (%)	2006[a] (%)
White	55	55	55	56	57	58	60
Black	29	29	28	26	25	23	22
Hispanic	9	10	10	11	11	12	12
Asian	[b]	[b]	[b]	3	4	4	4
Other	7	7	7	3	3	3	3

Notes:
a. Does not sum to 100% due to rounding error.
b. Asians were included in the "Other" category before 2003.

(3) Compared with the U.S. population, the U.S. Army has a slightly lower proportion of Caucasians and Hispanics and a higher proportion of Blacks and "Others" (Table 3).

Table 3. Race of Enlisted Soldiers in the U.S. Army Compared with the U.S. Population of High School Graduates 18–39 years old*

Race	U.S. Population Estimate of High School Graduates 18–39 years old (%)	Army Enlisted Soldiers (2005) (%)
White	62	58
Black	16	23
Hispanic	18	12
Other	4	7

*Source: U.S. Census, 2005 population estimates

b. Injury Risk Factors.

(1) Only two other studies have previously examined injury risk factors during Ordnance School AIT. One study examined injuries and injury risk factors of Soldiers in AIT who were training to become combat medics and the other study investigated injury risk factors among Ordnance School Soldiers.

(2) The first study[8] investigated injuries and injury risk factors among 439 men and 287 women participating in a 10-week medical combat AIT course. Investigators transcribed injuries from medical record reviews. They found that AIT injury incidence was 24% for men and 30% for women and BCT injury incidence was 26% for men and 52% for women. The largest proportion of injuries in BCT and AIT were overuse injuries and lower body injuries. Injury risk factors for women included split option, higher body mass, and older age (>25). For men, none of the examined injury risk factors were significant.

(3) The second investigation[9] examined injury risk factors among 1,243 male Soldiers attending Ordnance School AIT. They found that increased injury risk was associated with lower military rank, self-reported prior injury, prior cigarette smoking, and low performance on the initial physical fitness test (push-ups, sit-ups and 2-mile run). Factors that were not associated with injury were military occupational specialty (MOS), race, location of BCT, self-reported illness, smokeless tobacco use, and age. When all covariates were examined in a multivariate model, risk of injury was independently associated with self-reported prior injury and lower physical fitness.

c. Tobacco as a Risk Factor for Injury.

(1) The 2005 Department of Defense (DoD) Survey of Health Related Behaviors Among Active Duty Military Personnel, found that 32% of the service members had smoked a cigarette within the last 30 days and 15% had used smokeless tobacco in the last 30 days[10]. The 2004 Surgeon General's Report[11] discussed the negative health outcomes associated with smoking, such as coronary heart disease, stroke, cancers, emphysema, and obstructive pulmonary diseases, to name a few.

(2) Studies investigating injuries during BCT have shown that smokers are at a higher risk of injury than nonsmokers. The risk could affect the health and readiness of Soldiers on active duty. One investigation[12] showed that cigarette smoking in the month prior to BCT was significantly associated with overuse injury in both males (1.38 times higher injury rate) and females (1.13 times higher injury rate) compared with nonsmokers. Another study[3] showed that injury risk increased with the number of cigarettes smoked per day. Male smokers consuming < 11 cigarettes, 11–20 cigarettes/day and >20 cigarettes a day had risks 1.6, 2.0, and 2.8 times higher than nonsmokers, respectively. Female smokers consuming < 11 cigarettes, 11–20 cigarettes/day and >20 cigarettes a day had risks 1.7, 1.8, and 4.4 times higher than nonsmokers, respectively. A study performed with the British Royal Marines[13] also looked at the number of cigarettes smoked and injury rates. Risk of injury among those who smoked 1–9 cigarettes and > 10 cigarettes a day was 1.2 and 1.9 times higher than nonsmokers, respectively. Reynolds et al. also found similar results with infantry Soldiers[14]. These three studies suggested that injury risk increased with the amount of cigarettes smoked per day.

(3) When examining cigarettes and smokeless tobacco use, a study performed with Norwegian conscripts undergoing 10 weeks of basic infantry training showed that those who used cigarettes and those who used smokeless tobacco were, respectively, 1.5 and 1.8 times more likely to experience a musculoskeletal injury compared with those who did not use cigarettes or smokeless tobacco[15].

5. METHODS. From January 2000 to December 2006, USACHPPM and the KAHC worked with the 16th and 143rd Ordnance School Battalions at APG, Maryland, to administer a questionnaire to service members during their in-processing for AIT. The questionnaire was designed primarily to identify service members who might be in need of medical treatment on arrival at APG and collected other information that might be helpful in this regard. Questionnaire data were systematically collected and stored over a 7-year period.

a. Participants. Participants were service members attending AIT in the 16th and 143rd Ordnance battalions at APG from January 2000 to December 2006. Most students were Army personnel, but a few were from other services. Army students had recently (generally within a few days) graduated from BCT and most service members from other services (Navy, Marines, Air Force) had recently completed their respective service's basic training. Service members had just arrived (1–3 days) at APG to attend AIT and train for their MOS. Tables 4 and 5 display the

MOS for the 16th and 143rd Ordnance School Battalions. MOS consolidations took place in the 143rd on 1 Oct 2004 (Active Duty) or 31 August 2005 (Reserve), so that there were fewer MOS designations, as shown in Table 5.

Table 4. Military Occupational Specialties of the 16th Ordnance School Training Battalion

Metal Worker
Machinist
Small Arms / Artillery Repairer
Field Artillery Systems Repairer
Fire Control Repairer
Armament Repairer
Utilities Equipment Repairer
Power Generation Equipment Repairer
Turbine Power Generations Equipment Repairer
Quartermaster and Chemical Equipment Repairer

Table 5. Military Occupational Specialties of 143rd Ordnance School Training Battalion

143rd Ordnance School Former MOS	143rd Ordnance School Consolidation MOS
Self-Propelled Field Artillery System Mechanic	retitled – Artillery Mechanic
Fuel and Electrical System Repairer	deleted – tasks redistributed to Wheeled Vehicle Mechanics and Tracked Vehicle Mechanics
Track Vehicle Mechanic	Track Vehicle Mechanic
Wheel Vehicle Mechanic	Wheel Vehicle Mechanic
Track Vehicle Repairer	merged with Track Vehicle Mechanic

b. Data Collected.

(1) The Service members arriving for AIT were in-processed in a single day. An average of 99 ± 24 service members (from 2000–2006) were in-processed each week, with group size ranging from 4 to 221. As a part of the in-processing procedures, each service member was asked to fill out the Soldier Health In-Processing (SHIP) questionnaire. Each question was read by a moderator and then completed by the service member after the reading of the question. The

SHIP survey contains questions on date of birth (for age calculation), gender, military rank, race, the service member's BCT site, whether or not the person currently had an injury or illness that would affect AIT performance, and history of the tobacco use. Two questions on the Papanikolaou test (i.e., the PAP smear or PAP test) were added in 2002. Answers to these questions were not analyzed since data were not available for all seven years.

(2) Regarding injury, the questionnaire asked, "Do you have an injury that would adversely affect your performance during AIT?" and then proceeded to ask the area of the body the injury was affecting and when the injury occurred (before, during, or after BCT). The illness question mirrored the injury question, asking if the person had an illness that would affect performance during AIT, and the area of the body the illness was affecting. Because the area of the body where the injury and illness occurred was incomplete over the seven years of data collection, it was not analyzed for this report.

(3) The tobacco use questions were based on similar questions developed by the Centers for Disease Control and Prevention for the Youth Risk Behavior Surveillance System which asked high school students if they had smoked cigarettes on ≥ 1 of the 30 days preceding the survey and on 20 or more days in the last 30 days preceding the survey. The tobacco use questions on the SHIP survey asked if the service member had smoked one or more cigarettes within the 30 days prior to BCT and if they had smoked on 20 of the 30 days prior to BCT. If they answered "yes" to smoking one or more cigarettes within the last 30 days prior to BCT they were considered a "recent smoker." If they answered yes to smoking on 20 of the last 30 days prior to BCT, they were considered a "smoker." Those who used smokeless tobacco at least once in the 30 days prior to BCT were considered "recent smokeless tobacco users" and those who used smokeless tobacco on 20 or more days in the 30 days prior to BCT were considered "smokeless tobacco users."

c. Data Analysis.

(1) The Statistical Package for the Social Sciences (SPSS), Version 15.0, was used for statistical analysis. Descriptive statistics (frequencies, distributions) were calculated for demographics (age group, gender, race, military rank, and basic training site), injury, illness, and tobacco use variables. Chi-square was used to examine if there were differences between men and women. To examine potential temporal changes in these variables, students were aggregated by year from 2000–2006 and comparisons among years were made using chi-square and linear trend statistics. Means and standard deviations were calculated for some of the variables throughout the paper.

(2) Potential risk factors for self-reported injury and cigarette use were explored using logistic regression. Univariate logistic regression was performed with injury and cigarette use as separate health outcome variables. Odds ratios (OR) and 95% confidence intervals (95%CI) were calculated for each risk factor (independent variables). Risk factors from the univariate analysis with $p < 0.05$ were selected for backward-stepping multivariate logistic regression.

A value of $p < 0.05$ was required to be retained in the model. Multivariate ORs and 95%CIs were calculated.

6. RESULTS.

a. Descriptive Statistics.

(1) There were 27,289 men and 3,856 women who completed the questionnaire between 2000 and 2006. Table 6 shows the distribution of demographic, health and smoking variables factors among these men and women. Some service members did not answer some of the questions and these are listed as "missing" or "answered 'yes' to injury or illness but did not answer when."

(2) A majority of the service members were Caucasian men between the ages of 17 and 24 (mean ± SD age 20 ± 2 years), who were of lower military rank (E1) and had attended basic training at Ft Knox or Ft Jackson. Almost 9% reported having an injury that they felt might interfere with training and the majority of these injuries were reported to have occurred during BCT.

(3) Compared with women, men had a greater proportion of 20–24 year olds, Caucasians, and rank of E1. Compared with men, women had a greater proportion of 17–19 year olds, Blacks, and the military rank of E3. A substantial number of women (82%) attended BCT at Ft Jackson, compared with men (32%): most men had completed BCT at Ft Knox. When service members were asked if they presently had an injury or illness that would interfere with their training, women were 2.3 and 1.5 times more likely, respectively, to say "yes" compared with men. A small percentage of the men and women had a current illness which had occurred during BCT. A greater portion of men than women had smoked 1 or more cigarettes in the 30 days before BCT, on 20 or more days, and 20 or more cigarettes per day. Men were 5.5 and 6.4 times more likely than women to have used smokeless tobacco once in the 30 days before BCT, and on 20 or more days, respectively. Approximately 63% of the men and 81% of the women who used smokeless tobacco used less than 1 can, pouch, or plug a day, on average.

Table 6. Ordnance School SHIP Questionnaire Variables (Descriptive Statistics)[a]

Group	Variable	Level of Variables	Men		Women		Men and Women		Chi-Square p-value (men vs. women)
			n	%	n	%	n	%	
	Gender	Men					27289	87.3	
		Women					3856	12.3	
		Missing					106	0.3	
Demographics	Age	17–19	13093	48.0	2102	54.5	15237	48.8	<0.01
		20–24	10029	36.8	1184	30.7	11256	36.0	
		25–29	2515	9.2	345	8.9	2871	9.2	
		30+	1381	5.1	184	4.8	1569	5.0	
		Missing	271	1.0	41	1.1	318	1.0	
	Race	Caucasian	16761	61.4	2040	52.9	18833	60.3	<0.01
		African	4157	15.2	803	20.8	5003	16.0	
		Asian	831	3.0	114	3.0	956	3.1	
		Hispanic	3714	13.6	549	14.2	4275	13.7	
		Native	728	2.7	163	4.2	893	2.9	
		Other	790	2.9	147	3.8	937	3.0	
		Missing	308	1.1	40	1.0	354	1.1	
	Rank	E1	14192	52.0	1850	48.0	16102	51.5	<0.01
		E2	6473	23.7	979	25.4	7473	23.9	
		E3	5033	18.4	866	22.5	5915	18.9	
		E4	979	3.6	100	2.6	1083	3.5	
		E5 and above	344	1.3	22	0.6	367	1.2	
		Missing	268	1.0	39	1.0	311	1.0	
	Basic Training Site	Ft Jackson	8625	31.6	3175	82.3	11832	37.9	<0.01
		Ft Knox	13723	50.3	28	0.7	13799	44.2	
		Ft Wood	1061	3.9	466	12.1	1532	4.9	
		Ft Benning	1665	6.1	0.0	0.0	1672	5.4	
		Ft Sill	1394	5.1	120	3.1	1519	4.9	
		Other	438	1.6	26	0.7	467	1.5	
		Missing	383	1.4	41	1.0	431	1.4	
Injury	Presently have an Injury	No	n		%		n		%
		Yes	24847	91.1	3136	81.3			
		Missing	2078	7.6	671	17.4			
			364	1.3	49	1.3	n	%	
	When were you Injured?	Prior to BCT	223	0.8	36	0.9	28074	89.9	<0.01
		During BCT	1532	5.6	571	14.8	2755	8.8	
		After BCT	157	0.6	23	0.6	422	1.4	
		Answered "Yes" to injury but did not answer when	166	0.6	41	1.1			
		NA[b]_No Injury	24285	89.0	3008	78.0			
		Missing	926	3.4	177	4.6			

Table 6. Ordnance School SHIP Questionnaire Variables (Descriptive Statistics)[a] (continued)

Group	Variable	Level of Variables	Men		Women		Men and Women		Chi-Square p-value (men vs. women)
			n	%	n	%	n	%	
	Presently have an Illness	No	25769	94.4	3579	92.8	29442	94.2	<0.01
		Yes	517	1.9	112	2.9	630	2.0	
		Missing	1003	3.7	165	4.3	1179	3.8	
	When did your Illness begin?	Prior to BCT	68	0.2	18	0.5	86	0.3	<0.01
		During BCT	216	0.8	66	1.7	283	0.9	
		After BCT	54	0.2	9	0.2	63	0.2	
		Answered "Yes" to illness but did not answer when	179	0.7	19	0.5	198	0.6	
		NA_No Illness	25285	92.6	3450	89.5	28800	92.2	
		Missing	1487	5.4	294	7.6	1781	5.7	
Tobacco (Cigarettes)	Recent smoker	No	14999	55.0	2265	58.7	17322	55.4	<0.01
		Yes	11726	43.0	1540	39.9	13309	42.6	
		Missing	564	2.1	51	1.3	620	2.0	
	Smoker	No	16519	60.5	2492	64.6	19071	61.0	<0.01
		Yes	9731	35.7	1255	32.5	11021	35.3	
		Missing	1039	3.8	109	2.8	1159	3.7	
	If yes, how many cigarettes	≤10 per day	2914	10.7	483	12.5	3415	10.9	<0.01
		10–20 per day	4297	15.7	528	13.7	4835	15.5	
		≥20 per day	2339	8.6	220	5.7	2566	8.2	
		Non-smokers	16519	60.5	2492	64.6	19071	61.0	
		Missing	1220	4.5	133	3.4	1364	4.4	
Tobacco (Smokeless)	Recent smokeless tobacco user	No	22021	80.7	3608	93.6	25716	82.3	<0.01
		Yes	4239	15.5	109	2.8	4358	13.9	
		Missing	1029	3.8	139	3.6	1177	3.8	
	Smokeless tobacco user	No	22989	84.2	3634	94.2	26710	85.5	<0.01
		Yes	2960	10.8	66	1.7	3033	9.7	
		Missing	1340	4.9	156	4.0	1508	4.8	
	If used smokeless tobacco, how much?	Less than 1 can	1788	6.6	44	1.1	1834	5.9	0.02
		1 can (average)	902	3.3	8	0.2	913	2.9	
		2 or more cans	150	0.5	2	0.1	153	0.5	
		Non-smokeless	22989	84.2	3634	94.2	26710	85.5	
		Missing	1460	5.4	168	4.4	1641	5.3	

Notes:
a. The numbers in the column for men and women together are greater than the sum of the values for men and women separately, because they include the 106 persons missing the gender variable. Column percents do not always total 100 because of rounding error.
b. NA = Not Applicable

b. Temporal Trends in SHIP Questionnaire Variables, 2000–2006.

(1) Table 7 compares demographics, injury, illness, and tobacco use for men and women over the years 2000 through 2006. Temporal trends were apparent in almost all the questionnaire variables. Over the seven-year period, there was an initial decrease in the proportion of men to 2002, then a slight increase (Figure 1). The proportion of Ordnance AIT students 17–19 years old generally decreased, while the proportions of those 20–24, 25–29, and 30 plus increased (Figures 2 and 3). This trend was more apparent among the men than the women (Table 7). The proportion of male Caucasians progressively increased, while male Blacks and Native Americans decreased (Figure 4). The proportion of female Caucasians, Hispanics, and Asians increased, while female Blacks and Native Americans decreased (Figure 5). The proportion of male E1s entering the Ordnance School decreased from 2000 to 2004, then stabilized around 50%, while E2s and E3s showed the opposite trend. The military ranks of E4 to E5 and above generally increased during the survey period (Figure 6). The proportion of female E1s entering the Ordnance School decreased from 2000 to 2004, then stabilized around 50%. The proportion of E2s decreased in 2001 (compared with 2000), increased in 2002 and 2003, decreased in 2004 and 2005, and then increased in 2006. E3s increased from 2000 to 2004, then stabilized at 21%. The proportion of E4s increased in 2001 and 2002 (compared with 2000), decreased in 2003, increased in 2004, decreased in 2005 and then increased in 2006. The military rank of E5 increased in 2001 (compared to 2000), decreased in 2002 and 2003, increased in 2004, decreased in 2005 and then increased in 2006 (Figure 7). There was a great increase in the proportion of men and women arriving from Ft Jackson while there was a decrease in the proportion of men arriving from Ft Knox, Ft Leonard Wood, Ft Benning and Ft Sill and for women arriving from Ft Knox, Ft Leonard Wood, and Ft Sill (Figures 8 and 9).

Table 7. SHIP Questionnaire Variables by Year (2000–2006)[a]

Group	Variable	Gender	Level of Variable	2000 (%)[a] n = 3724	2001 (%)[a] n = 3523	2002 (%)[a] n = 4626	2003 (%)[a] n = 5176	2004 (%)[a] n = 4383	2005 (%)[a] n = 4312	2006 (%)[a] n = 5507	Chi-Square p-value	Linear Trend p-value
Demographics	Gender	Men		88.2	87.1	85.0	86.8	87.5	88.6	89.8	<0.01	<0.01
		Women		11.8	12.9	15.0	13.2	12.5	11.4	10.2		
	Age Group	Men	17–19	51.3	58.2	52.2	46.5	47.0	45.4	43.1	<0.01	<0.01
			20–24	36.6	32.1	34.7	39.3	39.5	37.6	38.2		
			25–29	8.3	6.4	8.7	9.2	9.1	10.4	11.6		
			≥30	3.9	3.3	4.3	5.0	4.5	6.6	7.1		
		Women	17–19	55.9	61.5	53.0	57.1	54.9	55.6	49.4	<0.05	0.01
			20–24	31.0	25.7	31.8	31.5	31.9	31.4	32.6		
			25–29	9.2	7.4	10.7	7.3	9.0	7.7	11.4		
			≥30	3.9	5.4	4.5	4.0	4.2	5.3	6.6		
	Race	Men	Caucasian	58.2	59.7	60.9	62.7	62.2	63.4	65.5	<0.01	<0.01
			Black	18.9	17.6	16.6	14.8	15.2	13.3	13.2		
			Asian	2.7	2.8	3.0	3.3	3.8	2.9	3.0		
			Hispanic	14.0	13.9	14.1	13.9	13.1	14.5	13.1		
			Native	3.9	3.9	3.5	3.4	1.8	1.5	1.5		
			Other	2.3	2.2	1.9	1.9	3.9	4.5	3.7		
Demographics	Race	Women	Caucasian	49.3	48.7	51.8	55.7	58.4	56.0	52.9	<0.01	0.06
			Black	27.0	26.2	24.3	19.4	15.6	15.4	20.5		
			Asian	2.1	2.9	2.5	2.8	3.5	3.3	3.8		
			Hispanic	12.7	12.9	15.1	14.2	12.1	18.3	15.2		
			Native	5.3	5.6	4.1	3.8	5.0	2.9	3.7		
			Other	3.7	3.8	2.3	4.1	5.4	4.1	3.8		
	Rank	Men	E1	59.0	58.5	51.9	50.8	48.5	51.3	50.6	<0.01	<0.01
			E2	21.3	22.1	24.9	25.6	25.9	23.6	23.4		
			E3	15.5	16.7	19.4	20.2	20.2	19.0	18.3		
			E4	3.4	2.0	2.7	2.9	4.0	4.5	5.1		
			≥E5	0.8	0.6	1.0	0.5	1.3	1.6	2.7		
		Women	E1	56.7	53.9	47.8	44.0	42.1	50.5	48.2	<0.01	<0.01
			E2	24.7	21.7	24.1	30.2	26.3	24.9	26.0		
			E3	16.3	21.7	24.1	24.1	27.0	21.7	21.6		
			E4	2.1	2.2	3.6	1.6	3.5	2.0	2.9		
			≥E5	0.2	0.4	0.3	0.0	1.1	0.8	1.3		

Table 7. SHIP Questionnaire Variables by Year (2000–2006)[a] (continued)

Group	Variable	Gender	Level of Variable	2000 (%)[a] n = 3724	2001 (%)[a] n = 3523	2002 (%)[a] n = 4626	2003 (%)[a] n = 5176	2004 (%)[a] n = 4383	2005 (%)[a] n = 4312	2006 (%)[a] n = 5507	Chi-Square p-value	Linear Trend p-value
	Basic Training	Men	Ft Jackson	13.4	19.4	33.3	28.4	36.1	47.2	40.2		
			Ft Knox	62.3	57.5	49.5	53.9	44.9	44.9	47.4		
			Ft Leonard Wood	4.4	7.2	3.5	5.0	4.1	2.9	1.6	<0.01	<0.01
			Ft Benning	12.7	9.8	7.6	5.5	5.2	1.5	3.4		
			Ft Sill	5.2	5.2	5.2	6.3	8.4	1.8	4.2		
			Other	2.0	.9	1.0	.9	1.4	1.7	3.2		
		Women	Ft Jackson	61.6	80.3	82.2	79.6	86.4	95.1	94.7		
			Ft Knox	2.1	0.4	0.4	0.6	0.9	0.2	0.7		
			Ft Leonard Wood	19.3	10.4	15.6	19.7	11.2	4.1	2.9	<0.01	<0.01
			Ft Benning	0.0	0.2	0.0	0.0	0.0	0.0	0.0		
			Ft Sill	16.1	8.2	1.3	0.0	0.2	0.0	0.5		
			Other	0.9	0.4	0.4	0.1	1.3	0.6	1.1		
Injury	Presently have an Injury?	Men	No	90.3	93.2	94.6	89.0	92.9	92.9	93.2	<0.01	<0.01
			Yes	9.7	6.8	5.4	11.0	7.1	7.1	6.8		
		Women	No	82.8	82.0	84.4	74.8	85.9	84.5	83.5	<0.01	0.34
			Yes	17.2	18.0	15.6	25.2	14.1	15.5	16.5		
	When were you injured?	Men	Prior to BCT	12.8	13.2	13.4	8.5	10.4	12.7	13.5		
			During BCT	78.0	78.4	78.5	85.2	78.8	80.2	77.6	0.34	0.88
			After BCT	9.2	8.4	8.1	6.3	10.8	7.1	8.9		
		Women	Prior to BCT	4.5	11.0	6.1	3.1	6.8	6.8	4.7		
			During BCT	93.9	82.2	90.9	93.7	86.5	93.2	90.6	0.24	0.84
			After BCT	1.5	6.8	3.0	3.1	6.8	.0	4.7		

Table 7. SHIP Questionnaire Variables by Year (2000–2006)[a] (continued)

Group	Variable	Gender	Level of Variable	2000 (%)[a] n = 3724	2001 (%)[a] n = 3523	2002 (%)[a] n = 4626	2003 (%)[a] n = 5176	2004 (%)[a] n = 4383	2005 (%)[a] n = 4312	2006 (%)[a] n = 5507	Chi-Square p-value	Linear Trend p-value
Illness	Presently have an Illness?	Men	No	96.1	98.1	98.6	98.0	98.4	98.2	98.3	<0.01	<0.01
			Yes	3.9	1.9	1.4	2.0	1.6	1.8	1.7		
		Women	No	96.6	96.4	97.5	95.2	98.7	96.9	97.6	0.03	0.22
			Yes	3.4	3.6	2.5	4.8	1.3	3.1	2.4		
	When did your illness begin?	Men	Prior to BCT	25.3	21.1	9.4	18.3	12.8	24.4	22.2	0.87	0.67
			During BCT	59.0	65.8	71.9	66.7	66.7	63.4	60.0		
			After BCT	15.7	13.2	18.8	15.0	20.5	12.2	17.8		
		Women	Prior to BCT	66.7	38.5	23.1	6.7	16.7	0.0	11.1	0.02	<0.01
			During BCT	33.3	53.8	61.5	83.3	66.7	92.3	77.8		
			After BCT	0.0	7.7	15.4	10.0	16.7	7.7	11.1		
Tobacco (Cigarettes)	Recent smoker?	Men	No	53.6	58.9	60.3	57.3	57.6	54.8	51.3	<0.01	<0.01
			Yes	46.4	41.1	39.7	42.7	42.4	45.2	48.7		
		Women	No	55.5	62.8	65.3	61.4	57.4	56.2	55.5	<0.01	<0.01
			Yes	44.5	37.2	34.7	38.6	42.6	43.8	44.5		
	Smoker?	Men	No	60.8	65.0	66.0	63.4	64.7	61.9	59.6	<0.01	<0.01
			Yes	39.2	35.0	34.0	36.6	35.3	38.1	40.4		
		Women	No	63.4	68.4	72.1	69.0	64.5	65.6	60.0	<0.01	<0.01
			Yes	36.6	31.6	27.9	31.0	35.5	34.4	40.0		
	If yes, how many cigarettes?	Men	Nonsmoker	61.8	65.3	66.3	63.7	65.1	62.3	60.0	<0.01	0.65
			≤10 per day	11.8	9.8	9.3	10.3	10.6	12.1	13.7		
			10–20 per day	15.9	14.2	15.4	16.4	16.3	17.4	18.6		
			≥20 per day	10.4	10.7	9.0	9.5	8.0	8.3	7.6		
		Women	Nonsmoker	64.9	68.7	72.2	69.0	64.7	65.9	61.0	0.03	0.04
			≤10 per day	15.1	12.6	10.5	10.4	14.3	13.0	16.7		
			10–20 per day	14.6	12.1	11.7	13.8	15.8	15.5	16.3		
			≥20 per day	5.4	6.6	5.5	6.8	5.3	5.6	6.0		
Tobacco (Smokeless)	Recent smokeless tobacco user?	Men	No	82.8	85.7	86.7	85.2	86.2	81.8	79.7	<0.01	<0.01
			Yes	17.2	14.3	13.3	14.8	13.8	18.2	20.3		
		Women	No	94.4	97.5	98.5	97.6	96.8	97.0	96.6	0.01	0.57
			Yes	5.6	2.5	1.5	2.4	3.2	3.0	3.4		

Table 7. SHIP Questionnaire Variables by Year (2000–2006)[a] (continued)

Group	Variable	Gender	Level of Variable	2000 (%)[a] n = 3724	2001 (%)[a] n = 3523	2002 (%)[a] n = 4626	2003 (%)[a] n = 5176	2004 (%)[a] n = 4383	2005 (%)[a] n = 4312	2006 (%)[a] n = 5507	Chi-Square p-value	Linear Trend p-value
	Smokeless tobacco user?	Men	No	86.4	90.0	91.0	89.7	90.0	87.8	85.7	<0.01	<0.01
			Yes	13.6	10.0	9.0	10.3	10.0	12.2	14.3		
		Women	No	95.9	97.9	98.9	97.4	99.0	98.7	99.1	<0.01	<0.01
			Yes	4.1	2.1	1.1	2.6	1.0	1.3	0.9		
	If used smokeless tobacco, how much?	Men	Nonusers	87.4	90.2	91.3	89.9	90.3	88.1	86.3	<0.01	<0.01
			<1 can	8.8	6.0	5.6	6.1	5.7	7.4	8.8		
			1 can (average)	3.4	3.0	2.7	3.4	3.5	4.0	4.2		
			≥2 cans	0.5	0.8	0.4	0.5	0.6	0.5	0.7		
Tobacco (Smokeless)	If used smokeless tobacco, how much?	Women	Nonusers	95.9	98.6	99.1	98.0	99.2	99.1	99.3	0.02	<0.01
			<1 can	3.1	0.9	0.9	1.5	0.8	0.9	0.6		
			1 can (average)	0.7	0.5	0.0	0.3	0.0	0.0	0.2		
			≥2 cans	0.2	0.0	0.0	0.2	0.0	0.0	0.1		

a. Percents do not always total 100 because of rounding error.

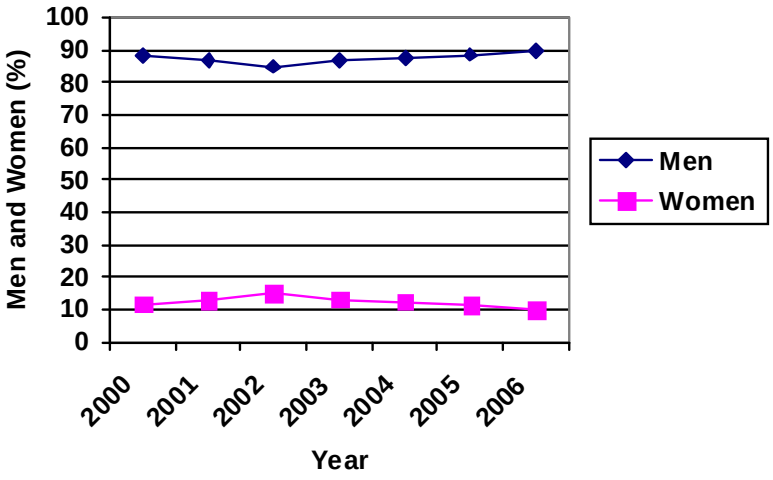


Figure 1. Distribution of Gender by Year (2000–2006)

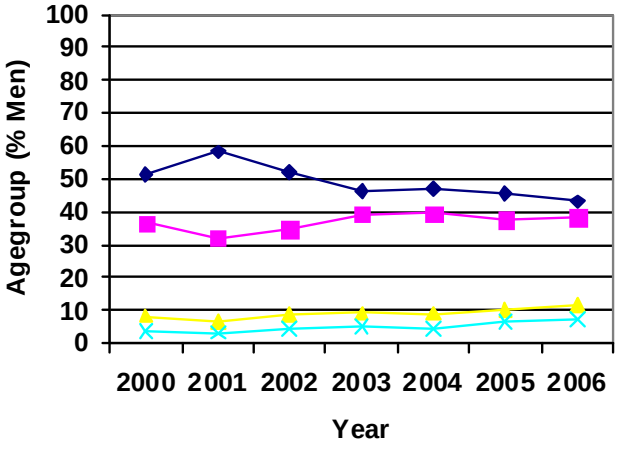


Figure 2. Distribution of Men by Age Group and Year (2000–2006)

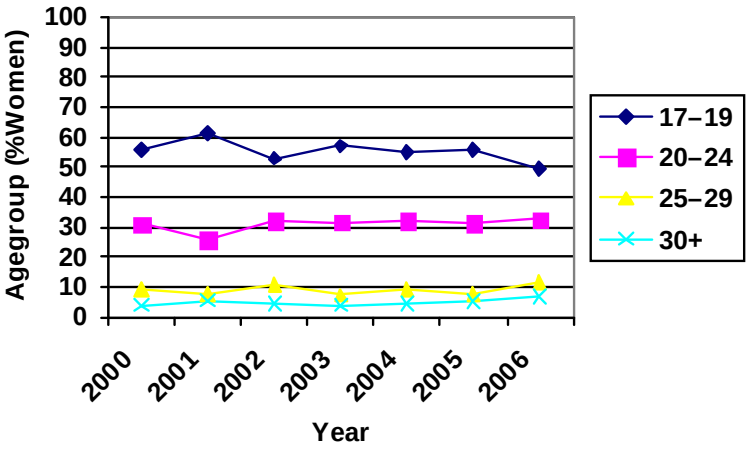


Figure 3. Distribution of Women by Age Group and Year (2000–2006)

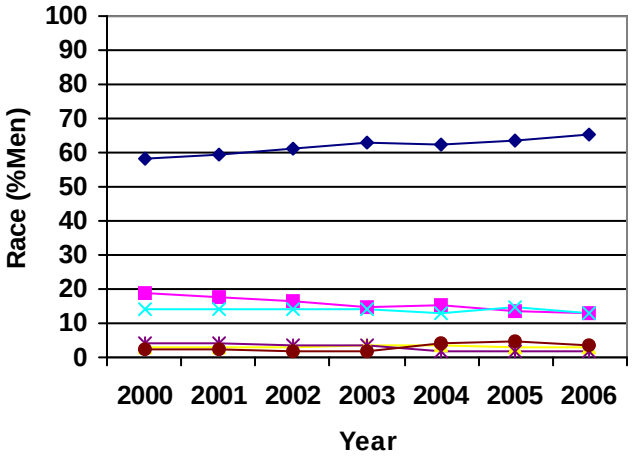


Figure 4. Distribution of Men by Race and Year (2000–2006)

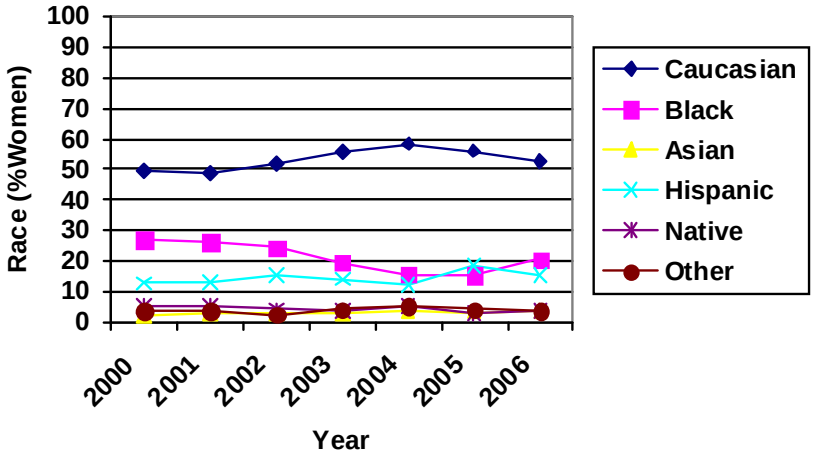


Figure 5. Distribution of Women by ace and year (2000–2006)

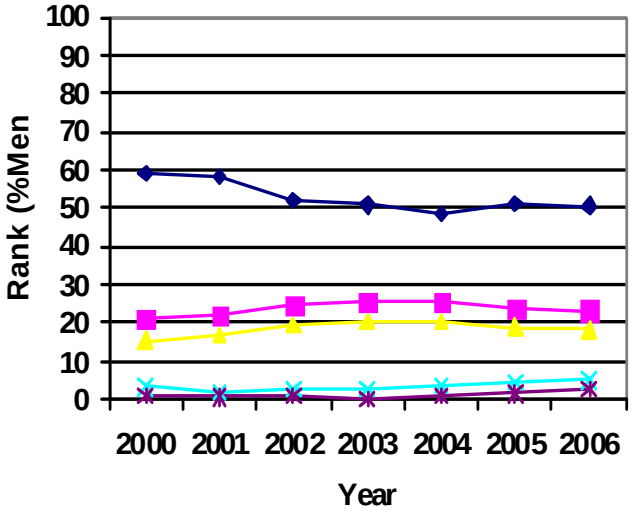


Figure 6. Distribution of Men by Rank and Year (2000–2006)

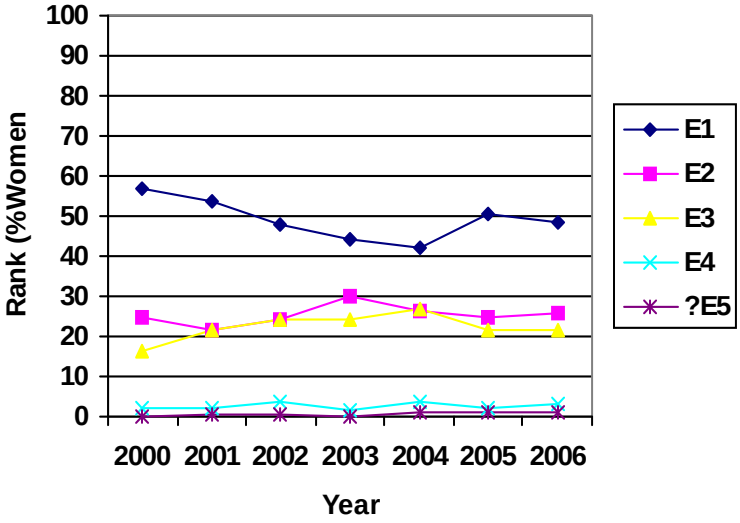


Figure 7. Distribution of Women by Rank and Year (2000–2006)

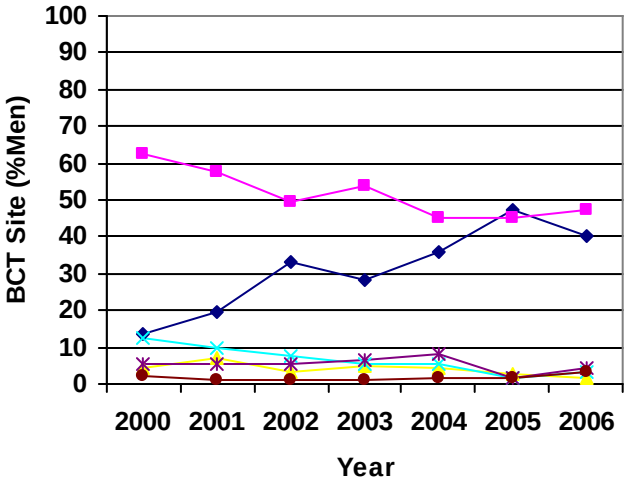


Figure 8. Distribution of Men Across Basic Training Sites, by Year (2000–2006)

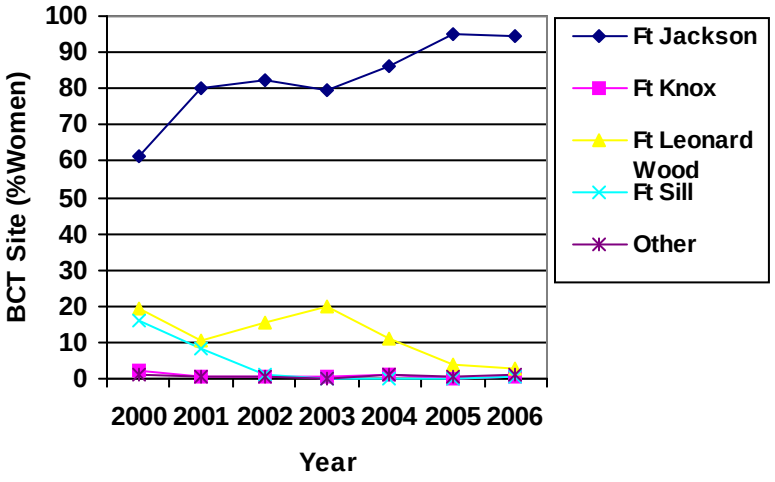


Figure 9. Distribution of Women Across Basic Training Sites, by Year (2000–2006)

(2) Among men, self-reported injuries decreased in 2001 and 2002 (compared with 2000), increased in 2003, and then continued to decrease. Otherwise, self-reported injuries showed no consistent trend over the survey years. However injury rates for men were almost twice as high in 2003 compared with 2002; similarly, women's self-reported injury was 1.6 times higher in 2003 compared with 2002 (Table 7). In all years more injuries were reported as having occurred during BCT than before or after (Figures 10 and 11). The year 2003 not only had the highest proportion of men and women reporting injuries but also the highest proportion of men and second highest proportion of women reporting that these injuries had occurred during BCT.

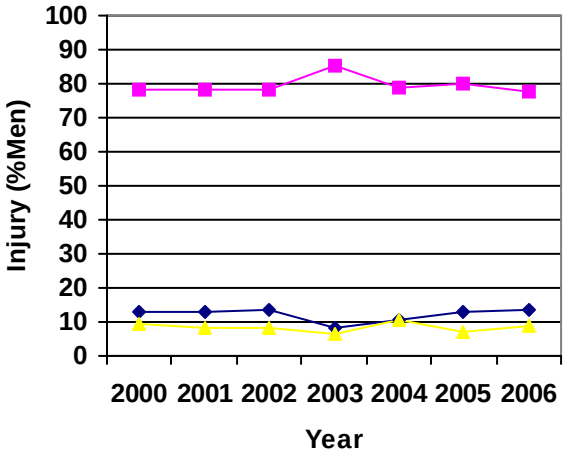


Figure 10. Distribution of Men by Period When Injury Occurred and by Year (2000–2006)

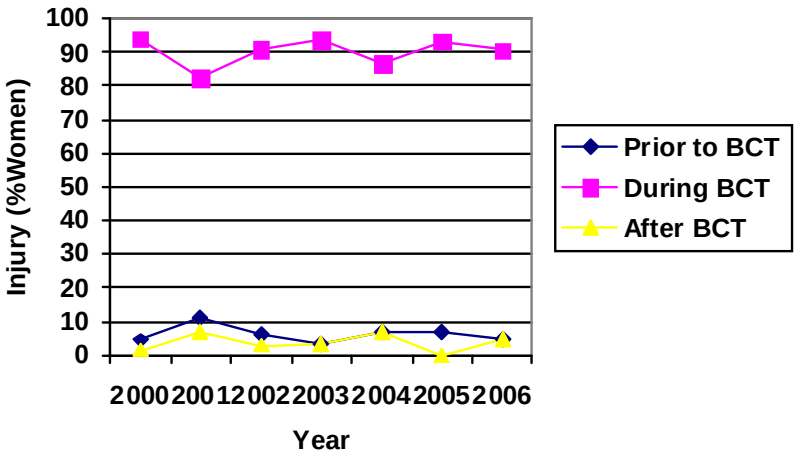


Figure 11. Distribution of Women by Period When Injury Occurred and by Year (2000–2006)

(3) For men, 2000 had the highest incidence of illness, which was lower every year thereafter (Table 7). Illness among women demonstrated little trend, although in 2004 self-reported illness was particularly low (Table 7). For men, there was no consistent trend over the years in where illness occurred (Figure 12). For women, illness prior to BCT decreased, while illness during BCT increased; however, the number of women answering yes to this question was very small (2000 n=9, 2001 n=13, 2002 n=13, 2003 n=30, 2004 n=6, 2005 n=13, 2006 n=9); therefore, the results could easily be influenced by chance in one direction or another (Figure 13).

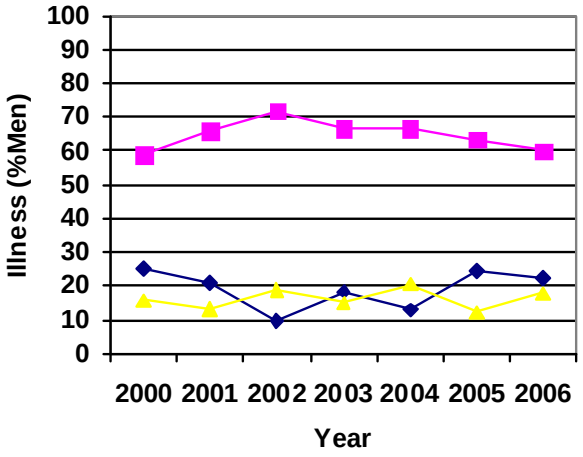


Figure 12. Distribution of Men by When Illness Began and by Year (2000–2006)

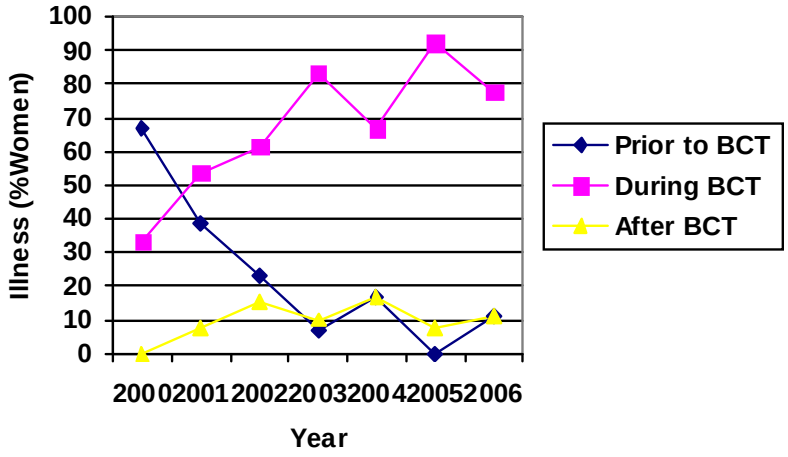


Figure 13. Distribution of Women by When Illness Began and by Year (2000–2006)

(4) There was no consistent trend in the proportion of men using one or more cigarettes or smoking on 20 or more days: Recent smokers and smokers decreased in 2001 and 2002 (compared with 2000), increased in 2003, decreased in 2004 and then progressively increased in 2005 and 2006 (Table 7). On the other hand, men tended to smoke fewer cigarettes (number of cigarettes per day) over time, with a smaller number of men reporting smoking 20 or more cigarettes each year (Figure 14). The proportion of women who were recent smokers decreased in 2001 and 2002 (compared with 2000), then progressively increased (Table 7). The proportion of women smokers decreased in 2001 and 2002, increased in 2003 and 2004, decreased in 2005 and increased in 2006. For women, there was no consistent trend in the number of cigarettes smoked (Figure 15).

(5) Among men, smokeless tobacco use (both questions: use smokeless tobacco at least once and use smokeless tobacco on 20 or more days) in the 30 days prior to BCT was higher in 2000, tended to be lower in 2001–2004, then increased in 2005–2006, surpassing the 2000 level (Table 7). Women differed on the trends for the two questions. For recent users, women showed a trend similar to that of the men, although the 2000 level was the highest of the survey period. Smokeless tobacco use on 20 or more days prior to BCT was highest in 2000 and tended to be lower after that, with no apparent or consistent pattern over the years. There was little apparent

trend in the amount of smokeless tobacco used (Figures 16 and 17). The number of women answering "yes" to this question was very small (n=54), so the percentages were easily influenced by the small numbers.

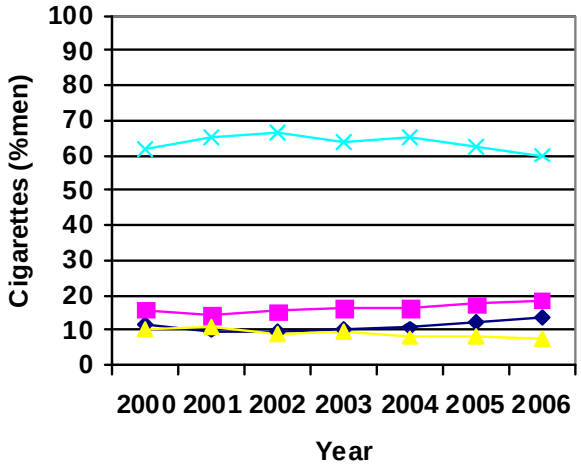


Figure 14. Distribution of Men by Number of Cigarettes Smoked in 30 Days and by Year (2000–2006)

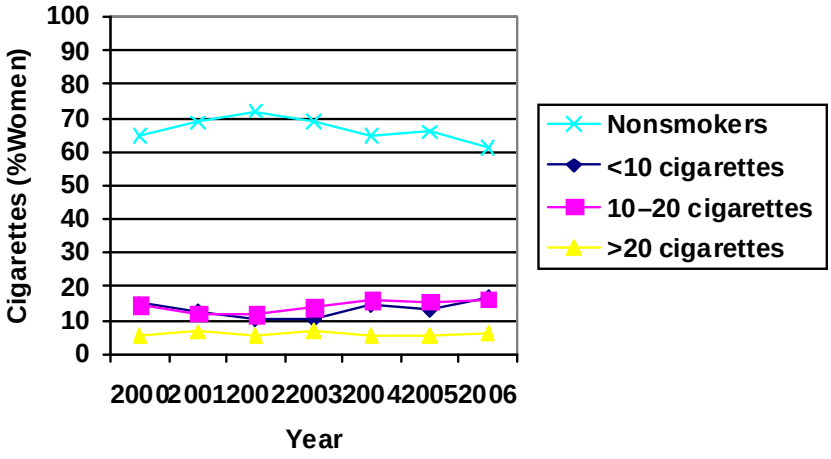


Figure 15. Distribution of Women by Number of Cigarettes Smoked in 30 Days and by Year (2000–2006)

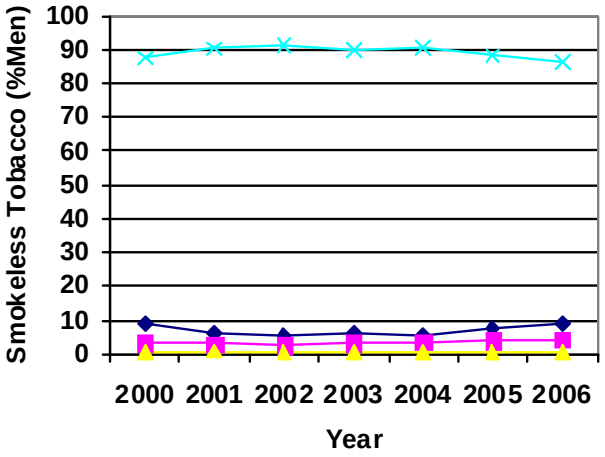


Figure 16. Distribution of Men by Amount of Smokeless Tobacco Use in 30 Days and by Year (2000–2006)

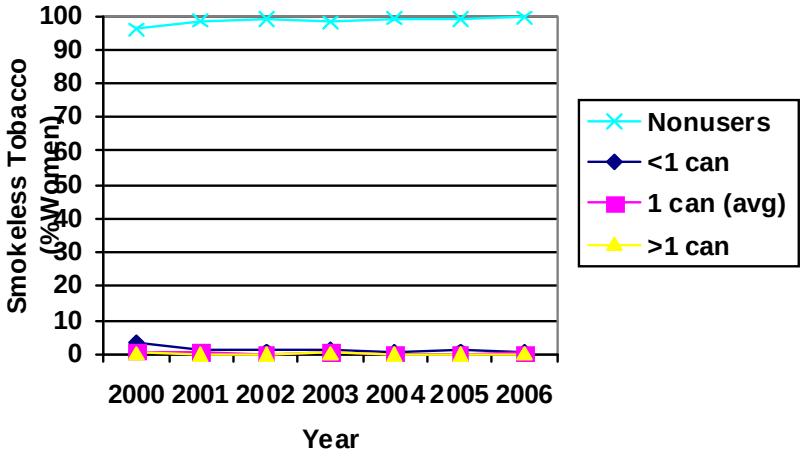


Figure 17. Distribution of Women by Amount of Smokeless Tobacco Use in 30 Days and by Year (2000–2006)

c. Risk Factors for Self-Reported Injury.

(1) Table 8 displays the results of univariate logistic regression with self-reported injury as the dependent variable. For men, injury risk was higher with older age, Black race (relative to Caucasians), military rank of E1 (relative to E3), a BCT location other than Ft Jackson, a current self-reported illness, or being a recent smoker or smoker. For women, injury risk was higher among those who were older, were of "other" races (relative to Caucasians), were E-4s (compared with E-1s), had basic training at Ft Leonard Wood (compared with Ft Jackson), or had a current self-reported illness. Smokeless tobacco use for 2 or more cans, pouches, or plugs was not included in the model for women due to the limited number of responses (n=2).

Table 8. Univariate Logistic Regression Results with Self-Reported Current Injury as the Dependent Variable

Variable	Survey Question	Category of Variable	Men				Women			
			n	Reported Injury (%)	Odds Ratio (95%CI)	p-value	n	Reported Injury (%)	Odds Ratio (95%CI)	p-value
Age Group		17–19	12913	6.4	1.00	---	2078	15.6	1.00	---
		20–24	9893	8.2	1.29 (1.17–1.43)	<0.01	1168	19.3	1.29 (1.07–1.56)	<0.01
		25–29	2485	10.2	1.65 (1.43–1.92)	<0.01	342	19.3	1.29 (0.96–1.74)	0.08
		≥ 30	1368	11.4	1.87 (1.56–2.24)	<0.01	180	27.2	2.02 (1.43–2.87)	<0.01
Race		Caucasian	16591	7.5	1.00	---	2022	16.6	1.00	---
		Black	4070	9.1	1.23 (1.08–1.38)	<0.01	788	18.4	1.13 (0.91–1.40)	0.26
		Asian	818	6.5	0.85 (0.64–1.13)	0.27	114	15.8	0.94 (0.56–1.58)	0.82
		Hispanic	3666	6.9	0.91 (0.80–1.05)	0.21	541	18.9	1.17 (0.91–1.49)	0.22
		Native	720	8.3	1.12 (0.85–1.46)	0.42	160	20.6	1.30 (0.87–1.95)	0.19
		Other	780	8.1	1.08 (0.83–1.41)	0.57	144	22.9	1.49 (0.99–2.24)	0.05
Rank		E1	14014	8.0	1.00	---	1828	16.6	1.00	---
		E2	6386	7.5	0.94 (0.84–1.05)	0.29	967	18.1	1.11 (0.91–1.36)	0.31
		E3	4965	7.1	0.88 (0.78–1.00)	0.04	851	17.7	1.09 (0.88–1.35)	0.45
		E4	967	8.1	1.01 (0.80–1.29)	0.91	100	27.0	1.86 (1.18–2.94)	<0.01
		≥E5	341	6.7	0.84 (0.54–1.28)	0.41	22	9.1	0.50 (0.12–2.17)	0.50
Basic Training Site		Ft Jackson	8513	6.6	1.00	---	3136	16.9	1.00	---
		Ft Knox	13560	8.1	1.25 (1.12–1.39)	<0.01	27	18.5	1.12 (0.42–2.97)	0.82
		Ft Leonard Wood	1042	9.1	1.42 (1.13–1.78)	<0.01	463	22.7	1.44 (1.14–1.83)	<0.01
		Ft Benning	1646	9.7	1.51 (1.26–1.82)	<0.01	115	[a]	[a]	[a]
		Ft Sill	1380	7.6	1.16 (0.94–1.45)	0.17	26	18.3	1.10 (0.68–1.78)	0.70
		Other	430	6.3	0.95 (0.64–1.41)	0.79		19.2	1.17 (0.44–3.13)	0.75
Illness	Presently have an illness?	No	25596	6.5	1.00	---	3556	15.3	1.00	---
		Yes	477	31.0	6.50 (5.32–7.94)	<0.01	103	50.5	5.66 (3.8–8.4)	<0.01

Table 8. Univariate Logistic Regression Results with Self-Reported Current Injury as the Dependent Variable (continued)

Variable	Survey Question	Category of Variable	Men				Women			
			n	Reported Injury (%)	Odds Ratio (95%CI)	p-value	n	Reported Injury (%)	Odds Ratio (95%CI)	p-value
	When did your illness begin?	Prior to BCT	61	34.4	1.00	---	17	47.1	1.00	---
		During BCT	196	33.2	0.94 (0.52–1.73)	0.85	61	50.8	1.16 (0.40–3.41)	0.78
		After BCT	53	30.2	0.82 (0.37–1.81)	0.63	9	55.6	1.41 (.28–7.13)	0.68
Variable	Survey Question	Category of Variable	Men				Women			
			n	Reported Injury (%)	Odds Ratio (95%CI)	p-value	n	Reported Injury (%)	Odds Ratio (95%CI)	p-value
Tobacco (Cigarettes)	Smoked 1+ cigs 30 days prior to BCT?	No	14808	7.3	1.00	---	2239	17.8	1.00	---
		Yes	11548	8.3	1.15 (1.05–1.26)	<0.01	1521	17.3	.96 (0.81–1.14)	0.68
	Smoked on 20+ days 30 days prior to BCT?	No	16311	7.3	1.00	---	2467	17.7	1.00	---
		Yes	9622	8.3	1.16 (1.05–1.27)	<0.01	1239	17.2	.97 (0.81–1.16)	0.72
	Cigarettes smoked/day?	Nonsmokers	16311	7.3	1.00	---	2467	17.7	1.00	---
		<10	2876	8.7	1.21 (1.06–1.40)	<0.01	479	18.4	1.05 (.081–1.35)	0.72
		10–20	4264	7.7	1.07 (0.94–1.21)	0.32	521	16.5	0.92 (0.72–1.19)	0.52
		≥20	2309	8.9	1.25 (1.07–1.45)	<0.01	216	16.2	0.90 (0.62–1.31)	0.59
Tobacco (Smokeless)	Used smokeless tobacco 1+ times 30 days prior to BCT?	No	21764	7.7	1.00	---	3568	17.8	1.00	---
		Yes	4193	8.0	1.04 (0.92–1.17)	0.53	107	15.0	0.81 (0.47–1.40)	0.45
	Used smokeless tobacco on 20+ days 30 prior to BCT?	No	22716	7.6	1.00	---	3596	17.7	1.00	---
		Yes	2929	8.3	1.10 (0.95–1.26)	0.19	65	23.1	1.40 (0.78–2.50)	0.26
	How many cans, pouches, or plugs?	Non users	22716	7.6	1.00	---	3596	17.7	1.00	---
		<1 can	1771	8.2	1.09 (.91–1.30)	0.36	43	23.3	1.41 (0.69–2.88)	0.34
		1 can on average	895	8.0	1.07 (0.83–1.36)	0.61	8	12.5	0.67 (0.08–5.41)	0.70
		≥2 cans	146	7.5	0.99 (0.54–1.84)	0.98	[b]	[b]	[b]	[b]

Notes:
[a] Women did not attend BCT at Ft Benning
[b] Not included in the model due to the limited number of responses (n=2)

(2) Table 9 displays the results of backward-stepping multivariate logistic regression with self-reported injury as the dependent variable. There were 24,177 (89%) men and 3,527 (92%) women who had complete data on all the variables and who could be included in the

multivariate analysis. Recent smokers, smokers and how many cigarettes smoked per day were all highly correlated; therefore, only smokers were retained in the multivariate model. Several variables were not retained in the final step of the models: rank for men, and rank and race for women. For men, higher risk of injury was independently associated with older age, Black race (relative to Caucasians), attending BCT training at Ft Benning, Leonard Wood, or Knox (compared with Ft Jackson), having a current self-reported illness, and smoking. For women, higher injury risk was independently associated with older age, attending training at Ft Leonard Wood (relative to Ft Jackson), and having a current self-reported illness.

Table 9. Multivariate Logistic Regression Results with Self-Reported Injury as the Dependent Factor

Variable	Category	Men			Women		
		n	Odds Ratio (95%CI)	p-value	n	Odds Ratio (95%CI)	p-value
Age Group	17–19	11810	1.00	---	1960	1.00	---
	20–24	8921	1.25 (1.12–1.40)	>0.01	1085	1.30 (1.06–1.60)	0.01
	25–29	2236	1.68 (1.42–1.98)	>0.01	319	1.47 (1.08–2.00)	0.02
	≥ 30	1210	1.90 (1.54–2.34)	>0.01	163	1.99 (1.35–2.91)	>0.01
Race	Caucasian	15250	1.00	---	[b]		
	Black	3539	1.21 (1.05–1.40)	>0.01			
	Asian	723	0.83 (0.60–1.16)	0.28			
	Hispanic	3321	0.92 (0.78–1.07)	0.28			
	Native	659	1.25 (0.93–1.66)	0.14			
	Other	685	1.12 (0.83–1.50)	0.47			
Basic Training Site	Ft Jackson	7835	1.00	---	2943	1.00	---
	Ft Knox	12307	1.31 (1.16–1.47)	>0.01	22	0.96 (0.28–3.25)	0.94
	Ft Leonard Wood	941	1.55 (1.20–1.99)	>0.01	436	1.49 (1.16–1.92)	>0.01
	Ft Benning	1459	1.72 (1.40–2.11)	>0.01	[a]	[a]	[a]
	Ft Sill	1236	1.14 (0.88–1.46)	0.32	102	0.87 (0.50–1.53)	0.63
	Other	399	0.84 (0.54–1.29)	0.43	24	0.93 (0.31–2.81)	0.90
Illness	No	23743	1.00	---	3425	1.00	---
	Yes	434	6.32 (5.11–7.82)	>0.01	102	5.80 (3.87–8.67)	>0.01
Smoker	No	15211	1.00	---	[c]		
	Yes	8966	1.19 (1.07–1.32)	>0.01			

Notes:
[a] Women do not attend BCT at Ft Benning.
[b] Did not reach the final step in the backwards stepping multivariate logistic regression.
[c] Not retained in the model because it did not meet the p<.05 criteria in the univariate analysis.

d. Risk Factors for Self-Reported Smoking.

(1) Table 10 displays the results of the univariate logistic regression models with smoking on 20 or more days (smokers) as the dependent variable. For men, smoking risk was higher for those 20–24 years old (decreasing with older age), Caucasians, recent smokeless tobacco users, smokeless tobacco users, and how much smokeless tobacco was used per day. For women, smoking risk was higher for those 20–24 years old (decreasing with older age), Caucasians, recent smokeless tobacco users, smokeless tobacco users, and how much smokeless tobacco was used per day. Smokeless tobacco use of two or more cans, pouches, or plugs was not included in the model for women due to the limited number of responses (n=2).

Table 10. Univariate Logistic Regression Analysis with Cigarette Smoking on 20 or more of 30 Days Prior to BCT as the Dependent Variable

Variable	Survey Question	Category	Men				Women			
			n	Smokers (%)	Odds Ratio (95%CI)	p-value	n	Smokers (%)	Odds Ratio (95%CI)	p-value
Age Group		17–19	12615	34.9	1.00	---	2037	29.8	1.00	---
		20–24	9622	41	1.29 (1.22–1.36)	<0.01	1154	39.4	1.53 (1.31–1.78)	<0.01
		25–29	2425	36.9	1.09 (1.00–1.19)	0.06	338	34.9	1.26 (0.99–1.61)	0.06
		≥ 30	1328	29.1	.76 (0.67–0.86)	<0.01	180	35.6	1.30 (0.94–1.78)	0.11
Race		Caucasian	16212	44.9	1.00	---	2006	44.5	1.00	---
		Black	3946	22.6	0.36 (0.33–0.39)	<0.01	765	15.8	0.23 (0.19–0.29)	<0.01
		Asian	798	29.7	0.52 (0.44–0.60)	<0.01	111	32.4	0.60 (0.40–0.90)	0.01
		Hispanic	3570	20	0.31 (0.28–0.33)	<0.01	534	18.7	0.29 (0.23–0.36)	<0.01
		Native	694	33.1	0.61 (0.52–0.71)	<0.01	154	33.8	0.64 (0.45–0.90)	0.01
		Other	757	36.2	0.69 (0.60–0.81)	<0.01	143	33.6	0.63 (0.44–0.90)	0.01
Tobacco (Smokeless)	Recent user?	No	21575	31.9	1.00	---	3553	32.2	1.00	---
		Yes	4061	62.4	3.54 (3.30–3.79)	>0.01	102	70.6	5.05 (3.28–7.78)	<0.01
	Smokeless user?	No	22554	33.5	1.00	–--	3575	32.6	1.00	---
		Yes	2827	59.4	2.90 (2.67–3.14)	>0.01	57	64.9	3.82 (2.21–6.61)	>0.01
	How many cans, pouches, or plugs?	Non users	22554	33.5	1.00	---	3575	32.6	1.00	---
		<1 can	1726	64.6	3.62 (3.27–4.01)	>0.01	37	75.7	6.42 (3.02–13.65)	>0.01
		1 can on average	847	48.8	1.89 (1.64–2.17)	>0.01	7	57.1	2.75 (.62–12.31)	0.19
		≥2 cans	143	53.1	2.25 (1.62–3.13)	>0.01	[a]	[a]	[a]	[a]

Note:
[a] Not included in the model due to the limited number of responses (n=2)

(2) Table 11 displays the results of the backward-stepping multivariate logistic regression with smoking on 20 or more days as the dependent variable (smokers). There were

24,177 (89%) men and 3527 (92%) women who had complete data and could be included in the multivariate analysis. Recent smokeless tobacco users, smokeless tobacco users and how much smokeless tobacco was used per day were all highly correlated, therefore only smokeless tobacco users were retained in the multivariate model. Among men, higher risk of smoking was independently associated with age 20–29, Caucasian race, and using smokeless tobacco. Among women, higher risk of smoking was independently associated with age 20 years or older, Caucasian race, and using smokeless tobacco.

Table 11. Multivariate Logistic Regression Results with Smoking on 20 or more days before BCT as the Dependent Variable

		Men			Women		
Variable	Category	n	Odds Ratio (95%CI)	p-value	n	Odds Ratio (95%CI)	p-value
Age Group	17–19	12070	1.00	-----	1965	1.00	-----
	20–24	9211	1.38 (1.30–1.46)	<0.01	1107	1.56 (1.32–1.83)	<0.01
	25–29	2341	1.27 (1.15–1.40)	<0.01	324	1.38 (1.07–1.79)	0.02
	≥ 30	1273	0.86 (0.75–0.98)	0.02	169	1.44 (1.02–2.04)	0.04
Race	Caucasian	15563	1.00	-----	1942	1.00	-----
	Black	3754	0.39 (0.36–0.43)	<0.01	721	0.23 (0.18–0.29)	<0.01
	Asian	754	0.55 (0.47–0.65)	<0.01	98	0.58 (0.37–0.89)	0.01
	Hispanic	3443	0.33 (0.30–0.36)	<0.01	519	0.29 (0.23–0.37)	<0.01
	Native	664	0.63 (0.54–0.75)	<0.01	151	0.65 (0.46–0.92)	0.02
	Other	717	0.69 (0.59–0.80)	<0.01	134	0.64 (0.44–0.92)	0.02
Smokeless tobacco users	No	22122	1.00	-----	3508	1.00	-----
	Yes	2773	2.33 (2.14–2.53)	<0.01	57	3.23 (1.83–5.68)	<0.01

7. DISCUSSION. This study shows that the service members attending the US Army Ordnance School at APG (2000–2006) were primarily male, between the ages of 17–24, Caucasian, of lower military rank (E1), and attended basic training at Ft Knox or Ft Jackson. Linear trends were noted for demographics, injury illness and tobacco use. Risk factors for self-reported injury for men included older age, self-reported illness, Black race (relative to Caucasians), BCT site, and cigarette use. For women, higher injury risk was associated with older age, BCT site, and having a current self-reported illness. For men, factors associated with self-reported cigarette use on 20 or more days (smoking) included age 20–29 years, Caucasian race, and using smokeless tobacco. For women, factors associated with self-reported cigarette use on 20 or more days (smokers) included 20 years of age or older, Caucasian race, and using smokeless tobacco.

a. Demographic Characteristics and Temporal Trends.

(1) The demographic characteristics of the Soldiers attending Ordnance School have changed throughout the last 7 years. Soldiers are older, and the proportion of Caucasians has increased while Blacks and Native Americans are decreasing in proportion. These demographic trends are also reflected by the Office of the Army demographics[7] (except for Native Americans, for whom no data are available). African Americans on active duty have declined

over the past 10 years; however, over the past three years accessions of African Americans have been fairly stable at about 15%, which reasonably reflects the national demographics (personal communication, Mr. Jack Dilbert, United States Army Accession Command). Accessions of Soldiers age 17–19 years (primarily high school seniors) has dropped from about 50,000 to 35,000 from 2002 to 2004, perhaps partly due to a directive to become more engaged with the college graduate market and less engaged with the high school senior market. By the end of 2004, efforts were made to regain high school seniors. However, since mission requirements were being met, the decline in high school seniors was being countered by the 20–24 year olds and, more recently, prior service 25–29 year olds (personal communication, Mr. Jack Dilbert). The rank of the Soldier entering AIT has progressively increased while the proportion of E1s has decreased, probably because college graduates are awarded more rank on entry to service for their educational achievement. The percentage of men arriving for AIT from Ft Jackson increased from 13.4% in 2000 to 40.2% in 2006, while those from Ft Knox decreased from 62.3% in 2000 to 47.4% in 2006. The percentage of women arriving from Ft Jackson increased from 61.6% in 2000 to 94.7% in 2006.

(2) Self-reported injury rates almost doubled for men in 2003 compared with 2002 and were 1.6 times higher for women during the same time period. It is difficult to hypothesize why injury rates spiked in 2003. The Training Related Injury Report (TRIR) is produced monthly by the Defense Medical Surveillance Activity and examines lower extremity overuse injuries in BCT. The TRIR data for Ft Jackson did show that injury rates increased 22% in 2003 (compared with 2002) and then decreased by 30% in 2004. Ft Knox showed no changes in injury rates from 2002 to 2004, and the combined data (for all five BCT sites) from 2003 to 2007 did not show an increase in training-related injuries in 2003. Therefore, it is not apparent why the injury rates reported by Soldiers entering the Ordnance School were higher in 2003. In contrast to injuries, self-reported illness remained low and changed little across the years of the survey.

(3) While the proportion of service members using cigarettes remained relatively stable over the 7-year survey period, there was evidence among the men that the number of cigarettes smoked per day decreased. Heavy cigarette smoking (20 or more per day) decreased from 10.4% in 2000 to 7.6% in 2006. The CDC[16] and the DoD[10] have also found that heavy smoking by men decreased over the past 11 years from 19.1% in 1993 to 12.1% in 2004 and from 34% in 1980 to 11% in 2005, respectively.

(4) Smokeless tobacco use among Ordnance School Students showed no consistent patterns or trends. This suggests a relative stable pattern in the prevalence of use over the survey period for both men (16% recent users and 11% users) and women (2% recent users and 2% users).

b. Risk Factors for Self-Reported Injury.

(1) Age was independently associated with a higher risk of injury and, as age increased, the risk of being injured also increased. Other investigations during BCT and AIT have also

shown that older recruits are at a higher risk of being injured[3, 5, 8, 15]. It has been suggested that when younger and older trainees all train at similar frequencies, intensities, and durations (as in AIT), the older trainees are at a greater risk of injury because of age-related fitness factors (5). With aging, there is a decrease in run speed and muscular endurance (which occurs around 30 years old), in addition to a decrease in lung vital capacity and aerobic capacity. These declines may contribute to the higher likelihood of injury[17, 18]. The civilian literature is inconsistent when investigating the association between age and injury, with some studies of physically active individuals showing no association[19, 20, 21], while other studies indicated that older age was associated with injury[22, 23, 24, 25].

(2) Black men and women of "other" races had higher injury risk. Black men appear to have a higher prevalence of lower extremity tendon injuries. In a study examining 865 U.S. military members who underwent Achilles tendon repair, the researchers found that Blacks had an overall increased risk of 4.15 (95% CI:3.63–4.74) for undergoing repair, when compared with non-blacks[26]. Another study, using data from 2000–2004 from the U.S. Defense Medical Epidemiology Database, found that, compared with Caucasian service members, Black service members had an adjusted rate ratio for quadriceps tendon tears of 2.89 (95%CI:2.42–3.44), patellar tendon tears of 4.52 (95% CI:3.94–5.19), and Achilles tendon tears 3.58 (95% CI:3.31–3.88) [27]. In a biomechanical study of the viscoelastic characteristics in the tricep surae between Black and Caucasian athletes, Black athletes were found to have a significantly greater muscle viscosity and muscle stiffness[28], which could result in tissue that is more likely to undergo failure if subject to sufficient trauma. On the other hand, Blacks were less likely to experience stress fractures, compared with Caucasians[29], possibly because Blacks having a higher bone density[30,31].Other studies performed during BCT and AIT have shown no differences when examining race and injury risk[8, 5, 32]. The present study cannot determine why Black men reported more injuries than Caucasians, but the factors above may be worth exploring in future studies.

(3) Both the univariate and multivariate analyses showed that men arriving from Ft Knox, Ft Leonard Wood, and Ft Benning had significantly higher injury rates than those arriving from Ft Jackson. For women, those arriving from Ft Leonard Wood had a significantly higher injury rate when compared with Ft Jackson. The service members arriving from Ft Jackson may have had a lower risk of being injured due to the multiple injury-reduction interventions introduced at that training facility[33]. In 1998, the Ft Jackson Training Center commander increased the emphasis on reducing injury rates and the USACHPPM established an injury coordinator position to provide state-of-the-art advice and material support to commanders and drill sergeants in reducing injury rates. Program monitoring from surveys and a Physical Training and Rehabilitation Program Surveillance System (a surveillance system developed by the Physical Therapy Department at Moncrief Army Community Hospital, Ft Jackson to track injury information) suggests that these interventions are associated with a reduction in injury rates. Further, several other epidemiological consultations and studies have been performed at Ft Jackson, which may have raised awareness of injury prevention measures and subsequently reduced injury rates[3, 32, 34, 35, 36, 37, 38, 4].

(4) Nearly a third of the men (31%) and half the women (50.5%) who reported being injured also reported being ill, and current illness was one of the strongest risk factors for injury. Other studies investigating injuries and illness[39, 40, 41, 42] also show high illness rates associated with higher injury rates. It is possible that the multiple stressors of BCT could have an impact on both injuries and illness.

(5) For men, injury risk was higher among smokers than nonsmokers. Previous studies have also demonstrated this relationship[3, 12, 13, 15, 43]. Smokers have impaired healing of fractures and wounds[44, 45, 46]. In a study examining the healing of tibial fractures, investigators found that smokers took 166 ± 92 days or had a 24% slower healing time to clinical union, compared with nonsmokers at 134 ± 71 days. Possible attributes of the delayed time to clinical union could be from decreased oxygen saturation levels and/or impaired blood flow to the injured area in smokers[46]. In examining the healing of wounds, it was found that 5 patients out of 15 who underwent intraoral bone grafting with simultaneous implant placement experienced impaired wound healing. Of these five, four admitted to smoking in the preoperative period. Vasoconstriction of the tissues due to nicotine was one of the suggested causes of the delayed healing[45]. Studies have also demonstrated the risk of low bone density with smoking[47, 48, 49, 50]. Suggested reasons for low bone density in smokers is that nicotine appears to interfere with bone metabolism through decreased osteoblastic function[51] and that smoking results in calcitonin resistance[52]. Several studies have found that smokers are at an increased risk of musculoskeletal injury[12, 14, 53, 54]. The relationship between tobacco use and musculoskeletal injury may be due to a compromised ability to repair damaged tissues, increasing susceptibility to overuse injuries[55]. For the number of cigarettes smoked per day, injury risk was higher for those who smoked less than 10 and 20 or more in the univariate analysis. Other studies have found that injury risk increases with the number of cigarettes smoked per day[3, 43, 13].

(6) Another possibility is that smokers may have reduced aerobic performance[56, 57]. However, younger smokers generally perform as well as younger nonsmokers, and it is not until later in age (~ 40 years old) that smoking influences aerobic performance[56, 57]. As a consequence, reduced aerobic performance levels mediated by smoking are unlikely to have influenced injury rates in this study.

c. Self-Reported Tobacco Use.

(1) The national average of current smokers in the U.S. is 21% or 45.3 million (where smokers are defined as those who smoked at least 100 cigarettes in their lifetime and were smoking everyday or some days during the time of the interview)[58]. The present study found that 35% of the service members had smoked on 20 or more days and 43% had smoked at least once in the 30 days prior to BCT. The 2005 DoD Survey of Health-Related Behaviors Among Active Duty Military Personnel[10] found that 32% reported any smoking (one or more cigarettes) within the 30 days before taking the survey, which is lower than the 43% of the Soldiers in the current study who had smoked at least once in the 30 days prior to BCT. The 2005 DoD

Survey[10] also found heavy smoking (one or more packs a day) to be 11%. In the current study, 9% of the men and 6% of women smoked one or more packs/day (Table 7), with heavy smoking among men declining over the years 2000–2006. When looking at any smoking and heavy smoking by service, the 2005 DoD Survey found that the Army had the highest rates for both compared with the other services (Table 14). It would appear that Ordnance School Soldiers (recent smokers) smoke more than the broader Army.

Table 12. Trends in cigarette use, during the past 30 days by service in 2005*

Cigarette use in Past 30 Days	Army	Navy	Marine Corps	Air Force	Total DoD
Any Smoking**	38.2	32.4	36.3	23.3	32.2
Heavy Smoking***	15.3	9.9	11.1	7.0	11.0

Notes:
* As reported in the 2005 Department of Defense Survey of Health-Related Behaviors Among Active Duty Military Personnel Report
** Any Smoking – Smoking one or more cigarettes within the past 30 days
*** Heavy Smoking – Smoking one or more packs of cigarettes per day

(2) The Youth Risk Behavior Surveillance System (YRBSS) monitors six categories of priority health risk behaviors, including smoking, among students in grades 9–12. For nationwide tobacco use from the time period of October 2004– January 2006, the survey found that 9% of the students had smoked on more than 20 of the 30 days preceding the survey[59]. In the present study, 35% of the men, and 30% of the women in the 17–19 age group smoked on 20 or more days in the 30 days before BCT, a much greater proportion than in the YRBSS sample. However, the lower percentage of cigarette use in the YRBSS sample may be constrained by the fact that those under 18 cannot legally buy cigarettes. The YRBSS does say that nationwide, 23% of the students had smoked one or more cigarettes 30 days preceding the survey and that nationwide 54% had tried cigarettes. Therefore, a greater number of students may have started smoking more cigarettes after graduation or started smoking after graduation from high school (as they would also be 18 years old and it would be legal for them to purchase cigarettes). Currently in the Army, the smoking prevalence is 49% and 31% for men ages 18–25 and 26–55, respectively. For women, current smoking prevalence is 32% and 19% for ages 18–25 and 26–55, respectively[10]. This shows a decrease in smoking with age, as was also demonstrated in the current study (Table 10). Another study found that 43% of active duty men were smokers, compared with 22% of incoming recruits[60]. From these results, the investigators suggested that exposure to the military environment leads to dramatic increases in tobacco use by young enlisted service members. In the civilian population, the percentage of individuals 18 and older who are current smokers is very similar across age groups, up to age 65: 24% among those 18–24, 24% 25–44, 22% 45–64, but 10% among those 65 and older[58].

(3) Higher risk of smoking was independently associated with age 20–29 for men and ages 20 and over for women, compared with those age 17–19. It is a possibility that smoking incidence in Soldiers 17–19 was diluted due to the fact that smoking prior to 18 is illegal and

many stores now check for identification. Risk of smoking increased in the 20–24 age group for men, then declined. It may be that after a period of experimentation with cigarettes older Soldiers are getting the message that smoking is not healthy.

(4) For both men and women, the univariate and multivariate analysis showed smoking risk to be highest among Caucasians. This has also been shown in the 2005 DoD Survey[10] and other studies investigating incoming military recruits[12, 60, 61]. It has also been shown that all other ethnic groups are less likely than Caucasians to be heavy smokers (>20 per day), with the exception of Native Americans[49]. A study of tobacco use among adults in the United States[62] found that current smoking was highest among American Indians and Alaska Natives at 32%, followed by Caucasians and Blacks at 22% each, Hispanics at 16%, and Asians at 13%. Looking at tobacco use among high school students[63], current smoking was highest for Caucasians at 26%, followed by Hispanics at 22% and Blacks at 13%. An investigation of ethnic differences between Blacks and Caucasians demonstrated that Blacks start using tobacco at an older age[64], are 1.5 times more likely to report a stronger desire to quit when compared with Caucasians, and are 1.8 times more likely than Caucasians to favor tobacco restrictions[65]. These factors may provide at least partial explanations as to why smoking risk is higher among Caucasians.

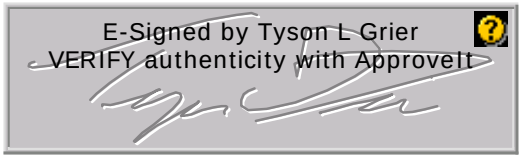
d. Smokeless Tobacco.

(1) This study found that 14% of the students (16% of the men and 3% of the women) had used smokeless tobacco at least once in the 30 days prior to BCT (recent smokeless tobacco users) and 10% of the service members (11% of the men and 2% of the women) had used smokeless tobacco on 20 or more days prior to BCT (smokeless tobacco users). Previous studies show that smokeless tobacco has been used predominantly by males[10,66] and that the average time men chewed per day was 481 minutes compared with women at 282 minutes per day[67]. The DOD survey (10) found a 19% prevalence of smokeless tobacco use in the Army (service members who reported using smokeless tobacco within the past 30 days), which is 5% higher than this study found at the Ordnance School (recent smokeless tobacco users). In the DoD survey, smokeless tobacco use had risen from 12% in 2002 to 15% in 2005[10]. Another study looking at smokeless tobacco use in male basic trainees found that 15% of high school graduates or those with some college were smokeless tobacco users and had generally moderate to high knowledge of the potential health effects from using smokeless tobacco[68]. The National Youth Risk Behavior Survey found that 8% (14% of males and 2% of females) of 9th to 12th graders used smokeless tobacco on one or more days in the last 30 days preceding the survey[69], which is 6% lower than the proportion of recent smokeless tobacco users in the Ordnance School.

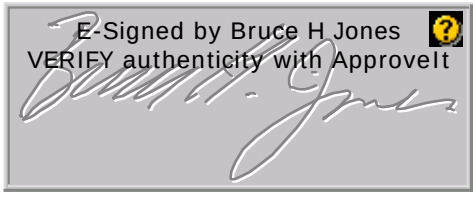
(2) The univariate analysis in the current study showed considerably higher risk of smoking among recent and smokeless tobacco users. Another study investigating smokeless tobacco as a risk factor for smoking found that youth (age 12–18 at the beginning of the 4-year study) who were not smokers but were smokeless tobacco users were more than three times as likely as never users to have become current smokers at the 4-year follow-up survey[70]. Another study also found that current smoking was a strong predictor of smokeless tobacco use (OR=3.0;

CI: 2.3–3.9)[71]. In a study of recruits in Air Force Basic Military Training (BMT), exsmokers reported a far higher rate of current smokeless tobacco use at 10% immediately preceding BMT, compared with current smokers (5%) or never smokers (4%). Males in BMT were 41 times more likely to be current smokeless tobacco users than females. Moreover, those who currently smoked and used smokeless tobacco also had the most risk-taking behaviors (least frequent seat belt use, highest use of alcohol and binge drinking, and greatest intake of high fat goods), when compared with never users, smokers, and dippers[66]. It may be that smokers also use smokeless tobacco as a source of nicotine dosing or as an alternative to smoking.

8. CONCLUSIONS. Temporal trends among US Army Ordnance School service members from 2000–2006 include an increase in older service members, Caucasians, and fewer men smoking more than 20 cigarettes per day. Injury risk factors identified in this study are similar to those previously seen in BCT but were found using an alternative method involving self-reported questionnaires upon arrival at AIT. Unique information was found regarding different injury risks at distinct BCT sites, indicating that Soldiers from Ft Jackson had a lower risk of injury than those from Ft Knox, Ft Benning, and Ft Leonard Wood. The multiple stressors of BCT could have led to the higher injury rates in service members who reported a current illness. Although cigarette smoking is not allowed during BCT, smoking prior to BCT was demonstrated to put men at higher risk of injury. Both men and women were identified as having a higher risk of smoking if they were Caucasians or used smokeless tobacco. The risk factors identified in this study could be used to establish strategies to reduce injuries in BCT and tobacco use in the military.



TYSON L GRIER
Health Scientist



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Program Manager, Injury Prevention

APPENDIX A
REFERENCES

1. Army (2005). Army Regulation 40-5: Preventive Medicine. Washington DC: Headquarters, Department of the Army.

2. Sharp MA, Patton JF, Knapik JJ, Smutok MA, Hauret K, Mello RP, Ito M, Frykman PN (2002). A comparison of the physical fitness of men and women entering the US Army during the years 1978-1998. *Medicine and Science in Sports and Exercise*, 34:356-363.

3. Knapik JJ, Sharp MA, Canham-Chervak M, Hauret K, Patton JF, Jones BH (2001). Risk factors for training-related injuries among men and women in Basic Combat Training. *Medicine and Science in Sports and Exercise*, 33:946-954.

4. Jones BH, Bovee MW, Harris JM, Cowan DN (1993). Intrinsic risk factors for exercise-related injuries among male and female Army trainees. *American Journal of Sports Medicine*, 21:705-710.

5. Jones BH, Cowan DN, Tomlinson JP, Robinson JR, Polly DW, Frykman PN (1993). Epidemiology of injuries associated with physical training among young men in the Army. *Medicine and Science in Sports and Exercise*, 25:197-203.

6. Primary Prevention of Injuries in Initial Entry Training. Knapik JJ, Hauret KG, Jones BH. (2006) Textbook of Military Medicine. Recruit Medicine. Lenhart MK, Lounsbury DE, North RB. Washington DC: Bordon Institute.

7. Army (2000-2006). Demographics. http://www.armyg1.army.mil/hr/demographics.asp

8. Henderson NE, Knapik JJ, Shaffer SW, McKenzie TH, Schneider GM (2000). Injuries and injury risk factors among men and women in US Army combat medic advanced individual training. *Military Medicine*, 165:647-652.

9. Knapik JJ, Canada S, Toney E, Canham-Chervak M, Hauret K, Lescault E, Hoedebecke E (2003). Injury risk factors among Ordnance School soldiers. *Medicine and Science in Sports and Exercise*, 35:S278.

10. DOD (2005) 2005 Department of Defense survey of health related behaviors among active duty military personnel.

11. DHSS (2004.) The health consequences of smoking: a report of the surgeon general. Washington DC: Dept of Health and Human Services, Center for Disease Control and prevention, National Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health.

12. Altarac M, Gardner JW, Popovich RM, Potter R, Knapik JJ, Jones BH (2000). Cigarette smoking and exercise-related injuries among young men and women. *American Journal of Preventive Medicine*, 18 (Suppl 3S):96-102.

13. Munnoch K, Bridger R (2007). Smoking and injury in Royal Marines training. *Occupational Medicine*, 57:214-216.

14. Reynolds KL, Heckel HA, Witt CE, Martin JW, Pollard JA, Knapik JJ, Jones BH (1994). Cigarette smoking, physical fitness, and injuries in infantry soldiers. *American Journal of Preventive Medicine*, 10:145-150.

15. Heir T, Eide G (1997). Injury proneness in infantry conscripts undergoing a physical training programme: smokeless tobacco use, higher age, and low levels of physical fitness are risk factors. *Scandinavian Journal of Medicine and Science in Sports*, 7:304-311.

16. Maurice E, Trosclair A, Merritt R, Caraballo R, Malarcher A, Husten C, Pechacek T (2005). Cigarette smoking among adults---United States, 2004. *MMWR Weekly*, 54:1121-1124.

17. Knapik JJ, Ang P, Reynolds K, Jones B (1993). Physical fitness, age and injury incidence in infantry soldiers. *Journal of Occupational Medicine*, 35:598-603.

18. Barowclough F (1981). The process of aging. *Journal of Advanced Nursing*, 6:319-325.

19. Macera CA, Jackson KL, Hagenmaier GW, Kronenfeld JJ, Kohl HW, Blair SN (1989). Age, physical activity, physical fitness, body composition and incidence of orthopedic problems. *Research Quarterly for Exercise and Sport*, 60:225-233.

20. Macera CA, Pate RR, Powell KE, Jackson KL, Kendrick JS, Craven TE (1989). Predicting lower-extremity injuries among habitual runners. *Archives of Internal Medicine*, 49:2565-2568.

21. Colbert LH, Hootman JM, Macera CA (2000). Physical activity-related injuries in walkers and runners in the Aerobics Center Longitudinal Study. *Clinical Journal of Sport Medicine*, 10:259-263.

22. Hootman JM, Macera CA, Ainsworth BA, Martin M, Blair SN (2002). Predictors of lower extremity injury among recreationally active adults. *Clinical Journal of Sport Medicine*, 12:99-106.

23. Taunton JE, Ryan MB, Clement DB, McKenzie DC, Lloyd-Smith DR, Zumbo BD (2003). A prospective study of running injuries: the Vancouver Sun Run "In Training" clinics. *British Journal of Sports Medicine*, 37:239-244.

24. Orchard JW (2001). Intrinsic and extrinsic risk factors for muscle strains in Australian football. *American Journal of Sports Medicine*, 29:300-303.

25. Bennell KL, Crossley K (1996). Musculoskeletal injuries in track and field: incidence, distribution and risk factors. *Australian Journal of Science and Medicine in Sport*, 28:69-75.

26. Davis J, Mason K, Clark D (1999). Achilles tendon ruptures stratified by age, race, and cause of injury among active duty U.S. military members. *Military Medicine*, 164:872-873.

27. Owens B, Mountcastle S, White D (2007). Racial differences in tendon rupture incidence. *International Journal of Sports Medicine*, 28:617-620.

28. Fukashiro S, Abe T, Shibayama A, Brechue W (2002). Comparison of viscoelastic characteristics in triceps surae between black and white athletes. *Aca Physiol Scand*, 175:183-187.

29. Brudvig TGS, Gudger TD, Obermeyer L (1983). Stress fractures in 295 trainees: a one-year study of incidence as related to age, sex, and race. *Military Medicine*, 148:666-667.

30. Trotter M, Broman GE, Peterson RR (1960). Densities of white and negro skeleton. *Journal of Bone and Joint Surgery*, 42A:50-58.

31. Barondess D, Nelson D, Schlaen S (1997). Whole body bone, fat, and lean mass in black and white men. *Journal of Bone and Mineral Research*, 12:967-971.

32. Knapik JJ, Sharp MA, Canham ML, Hauret K, Cuthie J, Hewitson W, Hoedebecke E, Laurin MJ, Polyak C, Carroll D, Jones B (1999.) Injury incidence and injury risk factors among US Army Basic Trainees at Ft Jackson, SC. 29-HE-8370-99, Aberdeen Proving Ground MD US Army Center for Health Promotion and Preventive Medicine

33. Primary prevention of injuries in initial entry training Knapik J, Hauret K, Jones B. (2006) Lenhar MK, Lounsbury DE, RB North eds. Textbook of Military Medicine Recruit Medicine. Washington DC: Bordon Institute.

34. Canham-Chervak M, Knapik JJ, Hauret K, Cuthie J, Craig S, Hoedebecke E (2000.) Determining physical fitness entry criteria for entry into Army Basic Combat Training: can these criteria be based on injury? 29-HE-1395-00, Aberdeen Proving Ground, MD: US Army Center for Health Promotion and Preventive Medicine.

35. Knapik JJ, Hauret K, Bednarek JM, Arnold S, Canham-Chervak M, Mansfield A, Hoedebecke E, Mancuso J, Barker TL, Duplessis D, Heckel H, Peterson J, (2001) TSotAPFS (2001) The Victory Fitness Program: Influence of the US Army's emerging physical fitness doctrine on fitness and injuries in Basic Combat Training. 12-MA-5762-01, Aberdeen Proving Ground, MD US Army Center for Health Promotion and Preventive Medicine.

36. Knapik JJ, Darakjy S, Scott S, Hauret KG, Canada S, Marin R, Palkoska F, VanCamp S, Piskator E, Rieger W, Jones BH (2004) Evaluation of two Army fitness programs: the TRADOC

Standardized Physical Training Program for Basic Combat Training and the Fitness Assessment Program. 12-HF-5772B-04, Aberdeen Proving Ground, MD: US Army Center for Health Promotion and Preventive Medicine.

37. Knapik JJ, Cuthie J, Canham M, Hewitson W, Laurin MJ, Nee MA, Hoedebecke E, Hauret K, Carroll D, Jones BH (1998) Injury incidence, injury risk factors, and physical fitness of U.S. Army basic trainees at Ft Jackson SC, 1997. 29-HE-7513-98, Aberdeen Proving Ground, MD: U.S. Army Center for Health Promotion and Preventive Medicine.

38. Westphal KA, Friedl KE, Sharp MA, King N, Kramer TR, Reynolds KL, Marchitelli LJ (1995.) Health, performance and nutritional status of U.S. Army women during basic combat training. T96-2, Natick, MA: U.S. Army Research Institute of Environmental Medicine.

39. Billings C (2004). Epidemiology of injuries and illnesses during the United States Air Force Academy 2002 basic cadet training program: documenting the need for prevention. *Military Medicine*, 169:664-670.

40. Jones BH, Manikowski R, Harris JR, Dziados J, Norton S, Ewart T, Vogel JA (1988) Incidence of and risk factors for injury and illness among male and female Army basic trainees. T19/88, Natick, MA: United States Army Research Institute of Environmental Medicine.

41. Shaffer RA, Brodine SK, Ito SI, Le AT (1999). Epidemiology of illness and injury among U.S. Navy and Marine Corps female training populations. *Military Medicine*, 164:17-21.

42. Darakjy S, Hauret KG, Canada SE, Knapik JJ, Wells J, Hodebecke EL, Kenyon M, Marin RE, Bullock SH (2003). Injuries and injury risk factors among armor battalion soldiers at Ft Riley, Kansas. *Medicine and Science in Sports and Exercise*, 35:S278.

43. Reynolds KL, Heckel HA, Martin JW, Pollard JA, Knapik JJ, Jones BH (1994). Cigarette smoking, physical fitness, and injuries in infantry soldiers. *Am J Prev Med*, 10:145-150.

44. Gu Y, Li J, Jiang J (1993). Circulatory crisis caused by cigarette smoking in tissue transfer. *Chinese Medical Journal*, 106:682-687.

45. Jones JK, Triplett RG (1992). The relationship of cigarette smoking to impaired intraoral wound healing. *Journal of Oral and Maxillofacial Surgery*, 50:237-239.

46. Kyro A, Usenius J, Aarnio M, Kunnamo I, Avidainen V (1993). Are smokers a risk group for delayed healing of tibial shaft fractures. *Annales Chirurgiae et Gynaeacologiae*, 82:254-262.

47. Mazess R, Barden H (1991). Bone density in premenopausal women: effects of age, dietary intake, physical activity, smoking, and birth-control pills. *American Journal of Clinical Nutrition*, 53:132-142.

48. Ortego-Centeno N, Munoz-Torres M, Jodar E, Hernandez-Quero J, Jurado-Duce A, Torres-Puchol JdlH (1997). Effect of tobacco consumption on bone mineral density in healthy young males. *Calcified Tissue International*, 60:496-500.

49. Ward K, Klesges R (2001). A meta-analysis of the effects of cigarette smoking on bone mineral density. *Calcified Tissue International*, 68:259-270.

50. Jones G, Scott F (1999). A cross-sectional study of smoking and bone mineral density in premenopausal parous women: effect of body mass index, breastfeeding, and sports participation. *Journal of Bone and Mineral Research*, 14:1628-1633.

51. Vernejoul MC, Bielakoff J, Herve M, Gueris J, Hott M, Modrowski D, Miravet L, Ryckewaert A (1983). Evidence for defective osteoblastic function. *Clinical Orthopedics*, 179:107-115.

52. Hollo I, Gergely I, Boross M (1977). Smoking results in calitonin resistance. *JAMA*, 237:2470.

53. Dettori J, Reynolds K, Amoroso P, Barnes J, Westphal K, Lavin P (1996). Smoking and injury risk among female US army basic combat trainees. Presented at the Third International Conference for Injury Prevention and Control. Melbourne, Australia

54. Association of tobacco use with injuries among infantry soldiers carrying loads on a 100 mile road march Reynolds K, Amoroso P, Dettori J. (1996) Presented at the Third International Conference for Injury Prevention and Control. Melbourne, Australia.

55. Amoroso PJ, Reynolds KL, Barnes JA, White DJ (1996) Tobacco and injuries: an annotated bibliography. TN96-1, Natick, MA: U.S. Army Research Institute of Environmental Medicine.

56. Knapik JJ, Jones BH, Reynolds KL, Staab JS (1992). Validity of self-assessed physical fitness. *American Journal of Preventive Medicine*, 8:367-372.

57. Daniels WL, Patton JF, Vogel JA, Jones BH, Zoltick JM, Yancey SF (1984). Aerobic fitness and smoking. *Medicine and Science in Sports and Exercise*, 16:195-196.

58. Rock V, Malarcher A, Kahende J, Asman K, Husten C, Caraballo R (2006). Cigarette smoking among adults--United States, 2006
MMWR Weekly, 55:14-17.

59. Eaton D, Kann L, Kinchen S, Ross J, Hawkins J, Harris W, Lowry R, McManus T, Chyen D, Shanklin S, Lim C, Grunbaum J, Wechsler H (2006). Youth risk behavior surveillance--United States, 2005. *MMWR Weekly*, 55:14-17.

60. Chisick M, Poindexter F, York A (1998). Comparing tobacco use among incoming recruits and military personnel on active duty in the United States. *Tobacco Control*, 7:236-240.

61. Williams L, Gackstetter G, Fiedler E, Hermesch C, Lando H (1996). Prevalence of tobacco use among first-term Air Force personnel before and after basic military training. *Military Medicine*, 161:318-323.

62. Mariolis P, Rock V, Asman K, Merritt R, Malarcher A, Husten C, Pechacek T (2006). Tobacco use among adults --- United States, 2005. *MMWR Weekly*, 55:1145-1148.

63. CDC (2006). Cigarette use among high school students ---United States, 1991-2005. *MMWR Weekly*, 55:724-726.

64. Lando H, Haddock C, Robinson L, Klesges R, Talcott G (2000). Ethnic differences in patterns and correlates of age of initiation in a population of Air Force recruits. *Nicotine & Tobacco Research*, 2:337-344.

65. Royce J, Hymowitz N, Corbett K, Hartwell T, Orlandi M (1993). Smoking cessation factors among African Americans and whites. *American Journal of Public Health*, 83:220-226.

66. Lando H, Haddock C, Klesges R, Talcott G, Jensen J (1999). Smokeless tobacco use in a population of young adults. *Addictive Behaviors*, 24:431-437.

67. Cohen-Smith D, Severson H (1999). A comparison of male and female smokeless tobacco use. *Nicotine & Tobacco Research*, 1:211-218.

68. Kenny KK, Quigley NC, Regennitter FJ (1996). Survey of smokeless tobacco use in basic training and Armor Basic Course officers. *Military Medicine*, 161:37-42.

69. CDC (2006). Youth risk behavior surveillance - United States, 2005. *MMWR Weekly*, 55:12.

70. Tomar S (2003). Is use of smokeless tobacco a risk factor for cigarette smoking? The U.S. experience. *Nicotine & Tobacco Research*, 5:561-569.

71. Ebbert J, Haddock C, Weg M, Klesges R, Poston W, DeBon M (2006). Predictors of smokeless tobacco initiation in a young adult military cohort. *American Journal of Health Behavior*, 30:103-112.

APPENDIX B
SOLDIER HEALTH INPROCESSING SHEET (EXAMPLE)

58295

Soldier Health Inprocessing Sheet, revised 7Jun01

ALL SOLDIERS FILL OUT THE FOLLOWING

1. Today's Date (DD-MM-YY) ☐☐ - ☐☐ - ☐☐ 2. SSN ☐☐☐ - ☐☐ - ☐☐☐☐

3. Last Name ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

4. First Name ☐☐☐☐☐☐☐☐☐☐☐☐☐☐ 5. Grade E☐ or 0☐ (E☐ Enlisted, 0☐ Officer)

6. Race

☐ Asian American ☐ Hispanic American

☐ African American ☐ Native American

☐ Caucasian American ☐ Other American

7. Gender

☐ Male ☐ Female

8. Date of Birth (DD-MM-YY) ☐☐ - ☐☐ - ☐☐ 9. Age ☐☐

10. Unit Assigned to:

☐ A (16th) ☐ B (16th) ☐ C (16th) ☐ D (16th) ☐ E (16th) ☐ A (143rd) ☐ B (143rd) ☐ C (143rd)

11. Basic Training Site:

☐ Ft. Jackson ☐ Ft. Knox ☐ Ft. Leonard Wood ☐ Ft. Benning ☐ Ft. Sill ☐ Other ☐☐☐☐☐☐☐☐

12. Do you presently have an injury that would adversely affect your performance during AIT?

☐ Yes ☐ No

13. Do you presently have an illness that would adversely affect your performance during AIT? ☐ Yes ☐ No

14. If your answer to Question #12 or #13 is Yes, what area of the body does the injury or illness affect?

☐ General Health ☐ Arm ☐ Lower Back ☐ Ankle

☐ Eyes ☐ Hand ☐ Hip and Upper Leg ☐ Foot

☐ Head ☐ Neck and Upper Back ☐ Knee ☐ Other ☐☐☐☐☐☐☐☐☐☐

☐ Shoulder ☐ Chest ☐ Lower Leg

15. When were you injured?

☐ Prior to BCT ☐ During BCT ☐ After BCT

16. When did your illness begin?

☐ Prior to BCT ☐ During BCT ☐ After BCT

17. In the space provided, tell us why you may need to see the doctor:

_____

18. Did you smoke 1 or more cigarettes in the 30 days before Basic Training? ☐ Yes ☐ No

19. Did you smoke on 20 or more days in the 30 days before Basic Training? ☐ Yes ☐ No

If yes, how many cigarettes? ☐ 10 or fewer cigarettes per day on average

☐ 10-20 cigarettes per day on average

☐ 20 or more cigarettes per day on average

20. Did you use smokeless tobacco (chewing, snuffing, pinching, etc.) at least once in the 30 days before Basic Training? ☐ Yes ☐ No

21. Did you use smokeless tobacco (chewing, snuffing, pinching, etc.) on 20 or more days in the 30 days before Basic Training? ☐ Yes ☐ No

If yes, how much? ☐ Less than 1 can, pouch, or plug per day on average

☐ 1 can, pouch, or plug per day on average

☐ 2 or more cans, pouches, or plugs per day on average

FEMALES ONLY:

22. Have you had a PAP smear in the last year? ☐ Yes ☐ No

If yes. were the results abnormal? ☐ Yes ☐ No